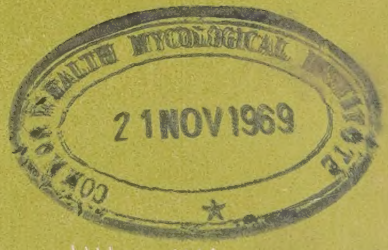
321A

annual report of the

indian council of agricultural research

1961-62

India House
NSP
RAM
MM



ICAR

Digitized by the Internet Archive
in 2025

https://archive.org/details/icar-annual-report_1961-1962

Annual Report
of the
Indian Council of Agricultural Research
for
1961-62

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI

Contents

		Page
1.0	Administration	1
2.0	Cereal and Plantation Crops	2
3.0	Agronomy	4
4.0	Mycology	5
5.0	Entomology and Animal Pests of Crops	6
6.0	Manures and Fertilisers	6
7.0	Agricultural Engineering	8
8.0	Horticulture	8
9.0	Vegetables and Floriculture	10
10.0	Commodity Crops	11
11.0	Agricultural Education	12
12.0	Animal Breeding	14
13.0	Animal Nutrition	16
14.0	Animal Diseases	17
15.0	Dairy Development	18
16.0	Sheep and Goat Breeding	19
17.0	Hides and Skins	21
18.0	Poultry Breeding	21
19.0	Apiculture	22
20.0	Pisciculture	22
21.0	Statistical Research	23
22.0	Publications and Information	26
23.0	Commodity Committees	26
24.0	General: Practical Utility of Results Achieved	33
	Appendices	37

1.0 Administration

1.1 The Council sanctioned 76 new schemes of research in the fields of agriculture, animal husbandry and allied subjects at a total cost of Rs. 44·69 lakhs (Appendix 1). Continuance of 112 current schemes was sanctioned at a cost of Rs. 37·72 lakhs (Appendix 2). Additional grants amounting to Rs. 8·82 lakhs for 23 current schemes were also given (Appendix 3). A sum of Rs. 25 lakhs was earmarked for sanctioning pilot projects which may be started for testing the results of research schemes. Sixty-three schemes terminated during the year (Appendix 4).

1.2 The income of the Council from various sources is given below:

(i)	Receipts from the Cess	Rs.	52,03,755
(ii)	Grants from the Government of India (Appendix 5) ..	Rs.	41,11,904
(iii)	Grants from other sources (Appendix 6) ..	Rs.	63,917
		Rs.	93,79,576

1.3 **Meetings, Conferences, Seminars and Shows.** Seventy-seven meetings of the various bodies of the Indian Council of Agricultural Research were held during the year (Appendix 7). Eleven conferences and seminars of research workers in the fields of agriculture, animal husbandry and allied subjects, an All-India Mango Show (juicy varieties) and an All-India Citrus Show were held (Appendix 8).

1.4 Lists of members of the Indian Council of Agricultural Research and its Governing Body, Standing Finance Committee, Advisory Board and Board of Research are appended (Appendices 9-13).

1.5 **Official Changes.** The following official changes took place in the Indian Council of Agricultural Research during the year 1961-62.

1.5.1 Consequent on the appointment of Shri V. Shankar, as Food Secretary, Shri G. R. Kamat, formerly Member-Secretary of the Third Finance Commission, took over as Special Secretary to the Government of India, Department of Agriculture and Vice-President, Indian Council of Agricultural Research on March 15, 1962.

1.5.2 On the appointment of Shri G. R. Kamat as Agriculture Secretary, Shri A. D. Pandit, formerly Officer on Special Duty (Agriculture and Rural Works) Planning Commission, took over as Special Secretary in the Department of Agriculture and Vice-President, I.C.A.R. on May 7, 1962.

1.5.3 Shri A. S. Bhatnagar, Additional Secretary, took over as Secretary, I.C.A.R., with effect from September 4, 1961 *vice* Shri S. K. Mirchandani who was

posted as Deputy Secretary in the Department of Agriculture after expiry of leave granted to him.

1.5.4 Shri N. S. Sreekantiah held the post of Additional Secretary, I.C.A.R. from the 4th September, 1961 to the 28th February, 1962.

1.5.5 Shri R. N. Mathur, retired Director of Agriculture, Uttar Pradesh, took over as Additional Agricultural Commissioner in the Indian Council of Agricultural Research with effect from the 6th March, 1962.

1.5.6 Dr. V. G. Panse, Statistical Adviser, Indian Council of Agricultural Research, returned from foreign service under the U.N.O. on the 19th March, 1962.

2.0 Cereal and Plantation Crops

2.1 **Rice.** During the year, the *Indica-Japonica* hybridization project was continued in Jammu and Kashmir, Andhra Pradesh, Madras, Maharashtra, Orissa, etc. In Jammu and Kashmir, secondary selections were done in the *Indica-Japonica* hybrid K. 60 to isolate strains which will be less non-shattering than K. 60. Breeding for resistance to salinity was continued in Andhra Pradesh and strains possessing greater tolerance to salinity are in view. At the Deep Water Paddy Station, Pulla, work on evolving early maturing varieties was continued. Breeding for dormancy in Madras has resulted in isolating desirable dormant strains while drought-resistant strains having white rice have been obtained by crossing cultivated rice with wild rice.

2.2 **Wheat.** Investigation on wheat was continued primarily on the problems relating to rust in Andhra Pradesh, West Bengal, Maharashtra, Powerkheda (Madhya Pradesh), Bijapur (Mysore), Gurdaspur (Punjab), Sri Ganganagar (Rajasthan), Kanpur (Uttar Pradesh), and at the Indian Agricultural Research Institute as well as in its sub-centres. As a result, seven strains of Gaza 39-1 were found uniformly resistant to stem rust. The strain 1-6-14-15-2 is likely to be released very shortly from Bijapur for general cultivation.

2.2.1 In the Punjab, C. 307, C. 303, C. 305 and WG. 109 gave significantly higher yields at Gurdaspur than the control (C. 286). Under rainfed conditions, C. 307 and C. 306 out-yielded the control. Seeds of three new strains viz., Hy. 51 Hy. 32 and Hy. 34 were supplied for growers' plot trials at Powerkheda (Madhya Pradesh) and the results were encouraging.

2.2.2 The regional trial of the different N.P. varieties resistant to different rusts showed that N.P. 824 had a wide range of adaptability, particularly in Bihar, West Bengal, Orissa, Gujarat, Maharashtra and Andhra Pradesh. N.P. 825 gave good results in the Punjab, Delhi, parts of Rajasthan and in north-eastern India, while N.P. 835 did well in Bihar, Orissa and West Bengal.

2.2.3 Under the Co-ordinated Wheat Rust Control Scheme at Indore, two varieties of *T. aestivum*, viz., N.P. 832 and N.P. 837 and one *durum*, viz., N.P. 404, have been recommended for multiplication in certain tracts of Madhya Pradesh.

2.3 **Maize.** The four double cross hybrids released, viz., Ganga 1, Ganga 101, Ranjit and Deccan were put to advanced tests against the locals at 33 locations spread over the entire country. The results indicated that all of them were superior to the local varieties, Ganga 101 by 58 per cent, Deccan by 51 per cent, Ranjit by 42 per cent and Ganga 1 by 22 per cent.

2.3.1 A comprehensive testing programme was conducted with 112 experimental double crosses located in various zones. Hybrid 29 was the top yielder in Zone No. 1, yielding 43 per cent more than the average of the local varieties. Certain of these hybrids also did well in other zones. For example, Hybrids 30 and 34 yielded 36 and 35 per cent more respectively than the local varieties in Zone No. 2. Also Hybrid 34 was found to be superior to local varieties by 47 per cent in Zone No. 3. Similar results with other hybrids were obtained from other zones, indicating the possibility of obtaining superior hybrids having wide adaptability.

2.4 **Jowar.** All the centres under the Project for Intensification of Regional Research on Cotton, Oilseeds and Millets, continued the work of evolving hybrid jowar capable of giving higher yield than the existing improved varieties and possessing grain acceptable to the consumers. Higher yield was obtained in a number of cases, but the grain was not quite as pearly as desired.

2.5 **Pulses.** The work of improving the seed, production technique and other aspects of various pulse crops is being continued at different research stations. Improvement work on red gram is in progress in Andhra Pradesh, Assam, West Bengal, Kerala and Madhya Pradesh; on gram in Andhra Pradesh, West Bengal and Madhya Pradesh; on black gram in Andhra Pradesh, Assam, Kerala and Madhya Pradesh; on green gram in Andhra Pradesh, Assam and Madhya Pradesh; on horse gram in Andhra Pradesh and Kerala; and on cowpea in Kerala and on *lablab* in Madras.

2.5.1 In red gram, promising strains like 1·5 in Assam, B. 34 in West Bengal and P.S. 427 in Madhya Pradesh yielding about 18, 19 and 8 maunds per acre respectively were spotted. No. 29 from West Bengal was found to be highly wilt resistant. Selection No. 15 and 42 in gram gave 49 and 19 per cent more yield than the respective locals in Andhra Pradesh. Similarly, *Chafa* variety was found to be the best in yield as well as in quality at Khargone (Madhya Pradesh).

2.5.2 A few strains like 113 and 134 of black gram in Andhra Pradesh and strains 32 and 26 in Assam proved promising, the last two yielding about 17 and 28 maunds per acre respectively. At Khargone, selection 56-73 yielded 40 per cent more than the local, and matured earlier giving better quality of *dal* and hence it was released as *urid* Khargone-3.

2.5.3 Selections 4, 20 and 284 in green gram showed promise in Andhra Pradesh, yielding 20 per cent more than their respective locals. Type 8-2 was the most outstanding in Assam with a yield of eight maunds per acre. At Khargone bold-grained, shining green-seeded early selection K-56-119 proved consistently outstanding, yielding 20 per cent more than the local variety.

2.5.4 In horse gram, selection No. 7, 18 and 35 showed promise in Andhra Pradesh, yielding 41, 76 and 82 per cent more respectively than their standards.

2.5.5 In *Dolichos lablab*, selection D.L. 2452 proved to be outstanding with about 32 per cent more yield of grain and 28 per cent of more yield of green matter than the existing departmental strains at Coimbatore in Madras.

3.0 Agronomy

3.1 The agronomic investigations conducted during the year may be broadly classified into studies on (i) fodders and forage, (ii) green manuring, (iii) weed, control and (iv) other agronomic investigations.

3.2 **Fodders and Forage.** Fodders and forage investigations were in progress in ten locations viz., Rajendranagar, Haringhatta, Dumraon, Poona, Coimbatore, Seoni, Bhopal, Dharwar, Mandya and at the I.A.R.I. The major programme in these investigations was the production of suitable short season fodder and forage crops sandwiched between the main crops, formulation of suitable grass legume mixtures to produce high tonnage of nutritious forage, and evolving improved varieties of annual and perennial fodder crops suited to different agro-climatic regions. Suitable varieties of legumes and grasses have been spotted out in various schemes. Also, measures for growing them under optimal farming conditions such as seeding, spacing and manuring were adopted. Manurial trials with different doses of manure gave a broad indication that the application of nitrogenous manure invariably resulted in a higher response from fodder-type grasses, while legumes proved to be more responsive to phosphatic than to nitrogenous manure.

3.3 **Green Manuring.** Investigations on green manuring were in progress at seven centres viz., Rajendranagar (Andhra Pradesh), Sabour (Bihar), Poona (Maharashtra), Mandya (Mysore) Kanpur (Uttar Pradesh), Jabalpur (Madhya Pradesh) and Amritsar (Punjab). The studies included: (i) evaluation of species and varieties of green manuring crops, trees and locally available leguminous weeds, (ii) study of the effect of important green manure crops on the yield of major crops, and (iii) formulation of suitable techniques to fit green manuring into the existing cropping patterns. Legumes sown between rows of cotton and also as green manure, when about 40 days old, increased cotton yields in Poona (Maharashtra) and at Mandya (Mysore). Dry wheat failed to respond to green manuring but irrigated wheat gave substantial response at Poona. Beneficial effect of green manuring was also observed on paddy at Mandya (Mysore) and on paddy and maize at Rajendranagar (Andhra Pradesh).

3.4 **Weeds and Weed Control.** The Co-ordinated Weed Control Scheme was in operation at ten centres, viz., at Jorhat (Assam,), Nagpur (Maharashtra), Solan (Himachal Pradesh), Ludhiana (Punjab), Ajmer (Rajasthan), Agra (Uttar Pradesh), Vellayani (Kerala), Baptala (Andhra Pradesh) and Gwalior and Bhopal (Madhya Pradesh). The main lines of work comprise (i) the formulation of suitable techniques of weed control in important crops of different regions, and (ii) the

development of measures for the eradication of pernicious perennial weeds such as nutgrass (*Cyperus rotundus*), *hariali* (*Cynodon dactylon*) and *kans* (*Saccharum spontaneum*). Post-emergence spraying with 2, 4-D, irrespective of the formulation (sodium salt, amine or ester) controlled most of the weeds in wheat. In paddy, *jowar* and *ragi* too, the weedicides were generally effective. Chemical weed control was more economical than the cultural method. In some crops a combination of the cultural and the chemical methods was generally more effective than the chemical or the local method of weeding alone. The wasteland weed, *Xanthium strumarium* was controlled by 2, 4-D at 1 lb. per acre, but nutgrass was suppressed only by higher doses.

3.5 **Other Agronomic Investigations.** Pot-culture studies on water relations of rice were undertaken at the Calcutta University. The effect of submergence and wetness at different stages of plant growth was studied on three varieties of *boro* paddy. Best results on tillering, growth, production of earheads and their development were observed in the treatment in which the soil was kept dry during germination, saturated during pre-tillering, submerged during tillering and pre-flowering, saturated during flowering and dry during post-flowering.

Research on the placement of fertilisers at Dharwar (Mysore) showed that a mixture of nitrogen and phosphate placed two inches deep and two inches away from seed or drilled was generally more effective than broadcast application in *kharif guar* and drilled paddy.

3.6 **Soil Science and Agricultural Chemistry.** The studies included reclamation of saline and alkali soils in the Punjab and Madras, lime requirements of acid soils in Kerala, biological nitrogen fixation at Poona (Maharashtra), uptake of different forms of phosphate in Madras, standardisation of methods of soil analysis in Maharashtra, methods for determining surface area of soils in the Punjab, distribution of micro-nutrients in the soils of the Punjab and study of their effect on the yield of crops in the Punjab and Maharashtra. In the Punjab sugar-beet proved to be a promising crop for cultivation on saline soils in rotation with *dhaincha* and paddy. Addition of gypsum and adequate manuring improved the performance of sugar-beet on alkali soil. The acid soils of Kerala gave substantial response to liming.

3.7 Studies on micro-nutrients in the Punjab showed significant responses to spray application of zinc sulphate (0·6 per cent) and copper sulphate (0·4 per cent) on maize at some of the centres. Pooled analysis of experiments at the experimental stations in Maharashtra showed the absence of responses to micro-nutrients. This was probably due to masking caused by high doses of farmyard manure generally used at the research stations.

4.0 Mycology

4.1 Work on blast and brown leaf spot of rice, rusts of wheat and maize, downy mildew and leaf blight of maize, black arm of cotton, wilt of betelvine and

zeera and die-back of citrus was continued. Resistant varieties and useful control measures were reported from a number of centres during the year.

4.2 Useful data has been collected on the comparative efficacy of various proprietary fungicides on certain diseases such as blast and brown spot diseases of paddy, stripe disease of barley, angular leaf spot of cotton, etc. which cause heavy annual losses.

4.3 Survey on smut disease of *bajra* in Gujarat showed its higher incidence in Saurashtra area than that in Gujarat area.

5·0 Entomology and Animal Pests of Crops

5.1 Toxicity and adverse effects of various insecticides were studied at the Indian Agricultural Research Institute, New Delhi, and at the Agricultural College and Research Institute, Coimbatore. At the Indian Agricultural Research Institute, it was found that D.D.T. and B.H.C. dust residues on tomato, pea and cabbage varied from 0·63 to 1·25 and 2·43 to 2·65 p.p.m. respectively. Trials on the relative efficacy of different types of jute-cloth bags against insects and insecticidal contamination of the food materials stored in these bags, showed that tightly woven hessian cloth bags discouraged insects and prevented insecticidal contamination much more than B-Twill jute bags.

5.2 **Field Rats.** Studies on field rats were continued. It was observed in Maharashtra that 92 per cent of the rats collected and identified were of *Rattus* species. Their life-history and food habits are being studied to find out suitable methods for their control.

5.3 **Harmful Birds.** Survey of various birds visiting cereals and fruit crops in Maharashtra showed that rose finch, parrot and *myna* were the most common and harmful. In the case of the weaver bird, a reduction in visits up to the extent of 83 per cent was observed by producing distress calls. Trials on the use of an automatic sound producing machine showed that it was useful to keep away migratory birds like parrots and rose finch, but was not so useful with non-migratory birds.

5.4 **San Jose Scale.** A survey conducted at the Regional Fruit Research Station, Mashobra, revealed that San Jose Scale is a serious pest of apple at altitudes between 5,000 and 6,000 feet, and woolly aphis attack was common at altitudes between 6,000 and 7,500 feet. Field trials on the control of insect pests indicated that spray of diesel oil emulsion 5:2:14 was effective against San Jose Scale and spraying of Basudin 20 per cent 1 : 640 emulsion proved to be more effective against woolly aphis.

6·0 Manures and Fertilisers

6.1 In the Third Five Year Plan, a provision has been made for increasing the fertiliser supplies in the country from about 0·23 million tons in 1960-61 to

one million tons in 1965-66 in terms of nitrogen, from 0·07 million tons to 0·4 million tons in terms of P_2O_5 and from 0·025 million tons to 0·2 million tons in terms of K_2O. To ensure efficient and economical utilisation of the fertilizer supplies, schemes were undertaken to study the responses to fertilisers in crop production under cultivators' field conditions and to popularise the use of fertilisers, particularly the new ones, and of fertiliser mixtures, through demonstrations.

6.2 **Fertiliser Demonstration Scheme.** The Scheme of Fertiliser Demonstrations, initiated in 1954-55, was continued during 1961-62. Under this scheme, different types of new fertilisers such as ammonium sulphate-nitrate, calcium ammonium nitrate, urea, super-phosphate and mono-ammonium phosphate are supplied free to the States for demonstration on cultivators' fields. During 1961-62, 3,500 metric tons of fertilisers were allocated to the States and about 1,52,000 demonstrations were laid out. The allocations included straight fertilisers as well as mixtures.

6.2.1 These demonstrations have paved the way for increased consumption of fertilisers. Intensified work is, however, necessary to increase the coverage so that phosphatic and some of the new nitrogenous fertilisers such as calcium ammonium nitrate become widely popular in the country.

6.2.2 Yield-data from demonstration trials continued to be collected by the field staff of the State Agricultural Departments. The data are analysed and interpreted by the Council's Institute of Agricultural Research Statistics. The results obtained so far show wide-spread response to nitrogen and phosphate and there was no significant difference among the responses to different forms of nitrogen.

6.3 **Co-ordinated Agronomic Experiments Scheme.** This scheme consists of two parts, i.e., (i) Simple Fertiliser Trials, and (ii) Model Agronomic Experiments. It was started in 1956 as a part of the Second Five Year Plan and is being carried over to the Third Five Year Plan.

6.3.1 Simple Fertiliser Trials. During the year, 8,000 simple fertiliser trials were conducted on cultivators' fields in 130 districts against a target of 200 districts. The data received from the States were compiled and statistically analysed. The responses to 20 lb. N per acre were medium to high (over 1·6 md./acre) in 87 per cent of the districts in wheat, and in 80 per cent of the districts in paddy. The corresponding percentage in respect of 20 lb. P_2O_5 per acre were 74 and 50 per cent respectively. The responses to 20 lb. K_2O per acre were medium to high (over 0·7 md. per acre) in more than 60 per cent of the districts in the two crops. Maps have been prepared showing areas giving varying degrees of responses to nitrogen, phosphate and potassium.

6.3.2 Model Agronomic Experiments. Over 200 complex experiments were conducted at 34 centres during 1961-62. At each centre a 15-acre block, located on cultivators' fields or on a newly established seed multiplication farm was selected for carrying out factorial experiments involving combinations of varying levels of nitrogen, phosphate, potassium, seed rate, sowing time, kind of fertiliser, crop rotations, frequency and depth of irrigation etc. It was found that reduced seed rate of 23 kg. per acre only was as good as higher seed rates normally

adopted by the cultivators. The residual effect of phosphate of the order of 20 to 30 per cent was recorded in areas responsive to phosphate application. Localised application of phosphate deeper in the soil was superior to broadcast application. Estimates of the responses of crops to different levels of nitrogen, phosphate and potassium in relation to cultural factors were worked out.

7.0 Agricultural Engineering

7.1 To intensify work on development and testing of implements, the facilities available in different States were discussed at the Conference held in Bombay in October, 1961 and a model scheme of Research, Testing and Training Centres was prepared and communicated to the States and steps were taken for the establishment of 17 centres, one in each State, inclusive of the four already sanctioned at the Indian Agricultural Research Institute, Delhi, Burdwan, Coimbatore and Poona. Testing techniques, designing and production methods were also discussed at the above Conference and steps were taken to prepare standard test proformae and procedures.

7.2 In a Conference held earlier in June, 1961, under the Chairmanship of the Agricultural Commissioner, a committee of experts met and discussed standardisation of implements and according to their recommendation, detailed drawings are being obtained for compiling an Implement Album. This Conference also finalised the technical programme for the four regional centres, and assessed the types of improved agricultural implements useful for different States and their probable requirements during the Third Plan.

7.3 Rules and regulations were compiled for the award of the President's Gold Medal for outstanding contribution to the production of agricultural implements. The scheme was given wide publicity and applications along with implements were collected through the State Directors of Agriculture.

7.4 A model scheme for demonstration and popularisation of improved agricultural implements was prepared and communicated to the different States and further action on the same was continued.

8.0 Horticulture

8.1 **Fruit Research.** Research on fruits gained momentum as a result of the additional facilities of finance, equipment and staff provided at the several regional centres in the country. Among the results of practical significance, mention may be made of the Bihar spray recipe of naphthalene acetic acid at 10 p.p.m. for reducing pre-harvest fruit-drop in mango, the control method at Kodur (Andhra Pradesh) of relieving citrus leaf of its miner pest with sprays of *neem*-cake water extracts, the technique of controlling the orchard weed flora at the same centre by monthly sprays of the chemical TCA at 80 lb. per acre, and the control of the banana aphid in Kerala by the use of insecticides such as Ekatin, Endrin,

Metasystex or Basudin. Several new temperate varieties of fruits from Britain, Japan and U.S.A. were introduced at Mashobra (Himachal Pradesh) and six new grape varieties from U.S.A. were introduced at Abohar (Punjab). Investigation on a new leaf disease in mango reported from Madras was started.

8.2 **Horticultural Development.** The scheme for development of fruit production was carried over to the Third Plan from the previous Five Year Plan. An area of 40,247 acres was covered with new orchards and 42,015 acres of existing orchards were rejuvenated during the year under report. Ancillary to this main programme, 73 gardeners completed their training during the year, while 385 are still under training.

8.3 **Fruit Crop Estimates.** In the Varanasi district of Uttar Pradesh, complete enumeration of 140 selected villages was made and estimates of the total number of mango orchards, gross areas, the total number of trees, both bearing and non-bearing and their variety-wise distribution were formulated. Similarly, in four districts of Kerala State, estimates of area under banana, the number of plants and pits and the size of orchards were formulated.

8.4 **Mango.** A co-ordinated scheme for intensification of research on mango was initiated in Uttar Pradesh, West Bengal, Andhra Pradesh and other States. Work on manurial requirements of the tree and the effect of manuring on physiological development was under way at Saharanpur (Uttar Pradesh). To check biennial bearing and to control pre-harvest drop, different plant-regulating substances were under trial at various places in Andhra Pradesh, Punjab, and Uttar Pradesh.

8.5 **Citrus.** A scheme for investigating into the citrus die-back disease continued to be in operation at Coorg (Mysore), Srirampur (Maharashtra) and at the Indian Agricultural Research Institute, New Delhi, where this problem was being tackled from manurial (major- and micro-elements), virological and root-stock points of view. Manurial trials were also conducted at the Fruit Experiment Station, Attari (Punjab) to find out the requirements of the plant as well as their effect on the yield and quality of the fruit. Investigations for finding out a suitable rootstock for citrus were in progress in Andhra Pradesh, Uttar Pradesh and the Punjab.

8.6 **Banana.** Research work on the various aspects of banana continued to be in progress in Madras, Maharashtra, Andhra Pradesh and West Bengal. Studies on the ripening of fruit gave encouraging results at Poona.

8.7 **Guava.** Varietal trials were in progress at Basti in Uttar Pradesh to find out the best variety with good quality fruit and high yield. Rootstock trials were continued at Saharanpur.

8.8 **Grapes.** Training and pruning trials were in progress in Madras to get the best returns from grape cultivation. Besides, a collection of various varieties and species of Vitaceae was maintained at Coimbatore.

8.9 **Deciduous Fruits.** Under the scheme for the survey of deciduous fruits in Kashmir, taxonomic description of varieties of apple, pears, plums, cherries and walnuts were made. Varieties of pecan-nuts, walnuts, almond, pistachio and

hazelnut were added to the programme for the intensification of research on nuts in Himachal Pradesh.

9.0 Vegetables and Floriculture

9.1 Research schemes for improving vegetable crops were in progress at Ludhiana and Patiala in the Punjab, Guntur in Andhra Pradesh, and in Kashmir, Himachal Pradesh and Madras. At these centres improved selections and strains of the commercially grown vegetables such as *bhindi*, brinjal, cabbage, cauliflower, tomato, beans, gourds, leafy vegetables etc., have become available for distribution.

9.2 **Tomato.** Under agronomic trials on tomato at Kurnool in Andhra Pradesh, application of 40 lb. of nitrogen per acre was found to give a yield of 3,529 Kg. of fruit per acre.

9.3 **Onion.** Research on onion in Maharashtra and Andhra Pradesh made steady advance. In a varietal trial in Andhra Pradesh, ' Bellary Big ' proved superior to eleven other promising types in yield. It was also observed that the crop raised through the transplanting of seedlings gave significantly higher yield than that raised from the direct planting of bulbs. Under storage trials at the Agricultural Station, Niphad, Maharashtra, bigger sized onions showed better storage capability.

9.4 **Chillies.** In a varietal selection programme, variety B-72-A was found to be significantly superior to the local, both in yield and tolerance to pests and diseases. Intensive selection work at Guntur (Andhra Pradesh) resulted in the isolation of a strain G-2 which proved superior to G-1 and local varieties by giving 40 per cent extra yield. Its fruit was highly thrip-tolerant and pungent. In a manurial-cum-spacing trial at Telengana, Andhra Pradesh, the spacing of $2' \times 6''$ gave the highest yield i.e., 1,448 lb. per acre. Close planting of each seedling at $5\frac{1}{2}''$ distance in the rows 22" apart was found to give 50 per cent more yield than that obtained in Andhra Pradesh from the local practice.

9.5 **Sweet Potato.** In a varietal trial on sweet potato in Andhra Pradesh, the Chinese variety gave significantly higher yield than the rest. Bed system of sowing gave increased yields over the furrow system in Andhra Pradesh. Cultural and manurial trials conducted in Kerala revealed that planting on ridges at 6" spacing in one direction and 2' in the other direction gave the best yield.

9.6 **Tapioca.** In a varietal trial in Andhra Pradesh, the Valencia variety gave the highest yield among the five varieties tested. In a manurial trial in Kerala, application of 100 lb. of N as ammonium sulphate and 120 to 160 lb. of potash as muriate of potash at a spacing of 3' gave the best yield.

9.7 **Haldi** (*Curcuma longa*). In a varietal trial, No. 18 out-yielded No. 32 out of the varieties tried. At Sabour, application of 40 lb. N per acre proved better than the application of either 20 lb. N per acre or no nitrogen at all. Work at Sabour on the keeping quality of the tubers revealed that their storage in gunny bags seemed to be better than their underground storage.

9.8 **Floriculture.** The co-ordinated scheme for the development of floriculture in the States, as well as for the maintenance of seeds and bulbs of imported ornamental plants, continued during the year. Seventy-nine varieties of *Bougainvillea* were collected and planted during the year at Rajendranagar in Andhra Pradesh. Out of these, seventeen varieties were tentatively grouped under four species, i.e. *B. glabra*, *B. peruviana*, *B. buttiana* and *B. spectabilis*. Five promising *Bougainvilleas* with attractive flowers were produced at Bangalore. Sixteen varieties of *Hibiscus* were also introduced from Hawaii.

9.8.1 Under the scheme for collection and maintenance of improved varieties of imported seeds and bulbs etc., 450 bulbs of 21 varieties of *Gladiolus* were procured from Kalimpong and planted at Mussoorie in Uttar Pradesh. At Mashobra, seeds of 34 varieties of nine types of annuals were studied. In addition, 32 varieties of perennials, like *Hydrangea*, *Fuchsia* and *Geranium* were studied.

9.8.2 At the Indian Agricultural Research Institute, New Delhi, rose seedling No. 7 gave the best performance in respect of colour and quality of blooms. Seedling No. 24 seemed to be promising in regard to colour, quality of blooms, and profuse and free flowering habit. Crosses of four rose varieties having deep colour were also made with special reference to quality of blooms and fragrance.

10.0 Commodity Crops

10.1 **Cashewnut.** At the Central Cashew Research Station, Mangalore, two high yielding selections (Nos. 61 and 64) were isolated. Against the accepted figure of 1,25,000 acres to be brought newly under this crop, an area of 78,090 acres is reported to have been brought under cultivation.

10.2 **Ginger.** WB/Z-36 was isolated as a low-fibre (3·97 per cent) type in West Bengal, while in Assam, G-55/1 (Nadia) and G-56/10 (Tuma) were listed as the promising types. Flied rot of ginger rhizomes was successfully checked in Assam by combining rigorous selection of seed material with Ceresan treatment.

10.3 **Cardamom.** Two cardamom selections with high capsule seed content of 30 were isolated in Mysore. Propagation through seed was also found to be superior to that through rhizomes, since the stand was more uniform and vigorous. Vegetative propagation resulted in an earlier yield by one or two seasons. Application of NPK mixture in the proportion of 6:8:12 at 200 to 300 Kg. per acre gave excellent results. During the year under report, the actual planted area under cardamom was 3,000 acres which is in excess of the target by 760 acres.

10.4 **Cocoa.** Vegetative propagation in cocoa which ensures trueness to type in the progeny, was secured through rooting of stem cuttings in Madras. In pruning trials, trees trained to fan-type system yielded more fruits than those which were not pruned.

10.5 **Turmeric.** Schemes for the improvement of turmeric are in progress in Andhra Pradesh and Orissa. Experiments showed that curing quality was largely a varietal character and it ranged from 14 to 26·5 per cent in different types.

Under agronomic trials, it was found that mother rhizomes when planted as wholes or even as split halves, gave more vigorous growth than when fingers were planted. Under manurial trials, good response was obtained by the application of NPK at 60, 60 and 100 lb. respectively per acre as compared to farmyard manure and green manuring. The dreaded ' Pogachuru tegulu ' on turmeric (a serious malady which affects the leaves of the plant) was found to be caused by a leaf mite and could be effectively controlled by spraying the foliage with 0·025 per cent solution of parathion.

10.6 **Medicinal Plants.** Medicinal plants continued to engage attention in schemes operated in Jammu, Dehra Dun and Madras. At Jammu, the maximum yield in *Ammi-visnaga* was obtained when 30 lb. of nitrogen from Chilean nitrate in combination with 30 lb. of phosphorus was applied.

10.6.1 In West Bengal, under manurial trials, *Digitalis purpurea* gave better yield with organic and inorganic types of nitrogen than the control. From this, one new strain named ' Rango ' was successfully evolved and this species is proving more economical when grown on a large scale.

10.6.2 In Madras, propagation studies in *Ipomea purga* showed that it could be successfully propagated by means of sprouts from tubers. Root cuttings of *Rauvolfia serpentina* treated with indolebutyric acid indicated that such treatments had the effect of sprout formation and 100 p.p.m. concentration produced larger number of laterals.

10.7 **Essential Oils.** At the Indian Agricultural Research Institute, New Delhi, an increase in oil content was noticed in *dhania* (coriander) and *saunf* (fennel) under the trials on the effect of storage on yield and oil content.

11.0 Agricultural Education

11.1 The anticipated requirements of agricultural and veterinary graduates during the Third Plan have been estimated at 20,000 and 6,800 respectively. The existing number of institutions in the country are considered adequate to meet this requirement with minor adjustments to meet local shortage.

11.2 A provision of Rs. 40 lakhs has been made during the Third Five Year Plan for aid to private agricultural colleges for improvement and expansion of training facilities. A sum of Rs. 12 lakhs was sanctioned to the Annamalai University to be spent in three years from 1961-62 to 1963-64. During 1961-62, a sum of Rs. 1·75 lakhs was sanctioned to the Annamalai University and Rs. 1 lakh to D.A.V. College, Ajmer. Applications for grants, received from certain other institutions are under consideration.

11.3 **Agricultural Universities.** During the Second Five Year Plan, one agricultural university on the pattern of Land Grants Colleges in U.S.A. was established at Pantnagar in Uttar Pradesh. During the Third Plan, a provision of Rs. 2 crores has been made in the Central Sector for the establishment of more agricultural universities.

11.3.1 Eight States have so far shown interest in the setting up of agricultural universities. The necessary legislation has been passed in the Punjab, Orissa and Rajasthan. The Andhra Pradesh Government will introduce a bill in the new legislature *de novo*. The State Governments of Mysore, Madhya Pradesh and Madras are scrutinising their draft bills while the Kerala Government has appointed a Working Group to consider the proposal.

11.3.2 A committee of experts with Dr. Ralph W. Cummings, Field Director, Rockefeller Foundation, as Chairman, was set up to examine the proposals of the various State Governments and also to assist them in finalising the draft legislation. The committee had detailed discussions with the officials of the various State Governments and has indicated broad principles for their consideration.

11.4 **Refresher Courses.** During the year under report refresher courses were considered in the subjects of agronomy, agricultural economics and farm management, animal genetics and animal pathology. These courses were attended by teachers of agricultural and veterinary colleges from different parts of the country.

11.5 **I.C.A.E.** The Fifth Session of the Indian Council of Agricultural Education was held in September, 1961 at New Delhi. Some of the important recommendations made by the Council are: (i) to establish a National Accreditation Body for accreditation of agricultural and veterinary colleges to improve the standard of agricultural education in the country, (ii) to adopt a uniform syllabus for the four-year B.Sc.(Agr.) course following the Higher Secondary course, and (iii) to establish regional teachers training centres.

11.6 **Inter-Institutional Arrangements.** The U.S./A.I.D. New Delhi, have extended material aid to agricultural and veterinary colleges by providing U.S. technicians, facilities for advanced study for the staff of these institutions in the U.S.A., and with regard to the supply of equipment and books to strengthen the teaching and research programmes. The break-up of the aid rendered up to 31st March, 1962 is indicated below:

	Upto 31st March, 1962	1961–62
U.S. technicians posted in colleges ..	89	13
Participants deputed for training ..	367	67
Books and equipment..	$27,97,007·90	$1,64,000·00
Against the provision of	$27,97,007·90	

Lists of equipment and books to the extent of $ 25,66,604 have already been approved and forwarded to the American Universities for procurement. The value of stores received up to 31st March, 1962 is $ 20,79,081.

11.7 Under a separate contract, the U.S./A.I.D. have provided assistance for planning and developing the U.P. Agricultural University at total cost of $ 11,20,500. This comprises $ 430,000 for equipment/books and $ 690,500 to cover the cost of technicians and participants. The U.S. Government have also agreed

to reimburse to the Government of India Rs. 1 crore out of PL 480 proceeds towards the construction of buildings and laboratories.

11.8 **Textbooks Scheme.** On the recommendation of the Indian Council of Agricultural Education, the Indian Council of Agricultural Research finalized a scheme for the production of textbooks. Under the scheme, three books have been published so far, eight are under print and about seventeen manuscripts are ready for the press. Twelve books on veterinary science have been taken up for production with the help of the Education Ministry.

11.8.1 Two issues of the Indian Journal of Agricultural and Veterinary Education were brought out during the year.

11.9 **Post-Graduate Fellowships.** Up to the year under report, 192 fellowships have been offered, in the subjects of agriculture and 49 in animal husbandry and veterinary science.

11.10 For the benefit of students from the States which do not have agricultural and veterinary colleges, arrangement has been made to reserve seats in other States having such facilities. During the year under report, 250 seats were reserved under this arrangement.

12.0 Animal Breeding

12·1 To bring about a rapid increase in the milk production of cattle in hilly and heavy rainfall areas, an experimental scheme for cross-breeding the non-descript cattle in these areas with Jersey bulls was launched by the Council. During the year, work under this scheme was done in 11 units in the different parts of the country. The unit located in Bihar was closed down and a new unit which will be operated in the Nasik area of Maharashtra State has been sanctioned.

12·2 In this scheme an attempt is being made to combine high-yielding quality of exotic breeds with the quality of better adaptability to local conditions of Indian cattle. In many centres the first generation of cross-bred female progeny has come into production and as a result of systematic milk recording which is being done in all the centres it has been found that the total lactation yield of the cross-bred progeny is much higher than that of their dams. In some of the centres the second generation progeny, produced as a result of forward or backward crossing, has also matured and their milk records for the entire lactation period are being maintained. In addition, regular records in respect of breeding behaviour and physiological response to environment are being maintained at all the centres.

12·3 The Central Artificial Insemination Station, Bangalore, which has been established for supplying Jersey semen to various units of the Cross-breeding Scheme continued to function successfully. This centre conducted investigations on the viability and preservation of semen as well as on the use of different diluents. Effects of long-distance transport by air, rail and road on the keeping quality of semen were also studied.

12.4 In order to meet the demands of the units located in the eastern part of the country, a regional artificial insemination station has been established at Haringhatta farm near Calcutta.

12.5 Preliminary trials were also conducted to find out the possibilities of producing deep-frozen semen. This would help to keep the diluted semen in a viable condition over a very long period for supply to inaccessible places. Deep-frozen semen obtained from outstanding bulls will also be stored and used for two years even after the bulls have gone out of function.

12.6 Under the Third Five Year Plan a comprehensive scheme for development of hill cattle by cross-breeding with the Jersey is being taken up. Since this would require use of a large number of Jersey bulls, a Jersey Farm has been established in the Mandi district of Himachal Pradesh. The Jersey stock for this farm has been obtained through the courtesy of the Heifer Project Inc., U.S.A. Systematic breeding of the Jersey stock will be done at this farm, so that it is possible to produce an adequate number of Jersey bulls for use in the country. It is also proposed to establish a second unit for the Jersey breed at Hessarghata farm in Mysore State. Arrangements for getting the breeding stock for this farm are being made.

12.7 In some areas, though the general type of cattle are non descript, certain well-defined strains exist. They are well adapted to local conditions, but their milk yield is low. A co-ordinated scheme for " comparative study to find out whether selective breeding within these strains or 'grading-up' with bulls of well-defined and improved breeds would be suitable " continued to function at six centres. Under this scheme, detailed observations are being made and elaborate records maintained. These indicate that though the milk yield in the case of progeny obtained by upgrading with bulls of improved breeds is higher than that obtained by using selected bulls of the local strain, there is some improvement in the latter case over the dams. The body weight is higher in the former group and its feeding is to be done on the basis of the body weight and milk yield, but it remains to be seen which group will ultimately be more economical.

12.8 The progeny-testing scheme for the production of tested buffalo-bulls continued to function at the Aarey Milk Colony. Under this scheme, ten buffalo-bulls are being tested through scientific methods to assess their ability to transmit high-yielding quality to the progeny. A scheme for progeny testing of bulls of Hariana and Murrah breeds is being taken up at the Government Livestock Farm, Hissar. These two breeds have been selected as they are being used in several States for upgrading the local stock.

12.9 Buffaloes are known to be seasonal breeders. This breeding behaviour results in uneven production and supply of milk for human consumption. Under a scheme functioning at the U.P. College of Veterinary Science and Animal Husbandry, the causes for this irregular breeding during summer months are being investigated.

12.10 A scheme for the survey of yaks and cattle breeding operations in the interior hilly areas has been sanctioned for collecting necessary information regarding

population, distribution, etc., of yaks, and their breeding, feeding and management practices, etc. On the basis of the information that is being received through this survey, suitable schemes for the improvement of yaks are being prepared.

12.11 **Cattle Sterility Scheme.** The study of the problem of infertility in cattle which causes considerable economic losses to the country was continued under a co-ordinated scheme. This scheme was initiated in the First Five Year Plan with the main object of (a) conducting investigations on the infertility of cattle with a view to developing appropriate remedial and preventive measures, (b) improving the teaching of Animal Gynaecology and Obstetrics, including artificial insemination and physio-pathology of reproduction.

12.11·1 In the First and the Second Plans the investigations were taken up in eleven States and at the Indian Veterinary Research Institute. The investigations were made on the State farm animals and in the villages and causes leading to infertility among them were investigated. For several important conditions, remedial measures were also brought out. In several States, permanent chairs of the Professors of Animal Gynaecology and Obstetrics have been created on the termination of the Cattle Sterility Scheme.

13.0 Animal Nutrition

13.1 The Council continued to finance research programmes at the Regional Animal Nutrition Stations, Indian Veterinary Research Institute, Izatnagar and at certain State Research Stations.

13.2 **Southern Regional Animal Nutrition Research Station, Bangalore.** Studies were conducted to find out the effect of the substitution of 20 per cent DCP content of concentrate mixture by *para* grass on milk yield of the *Thari* cows. Another problem of the effect of feeding cheap balanced ration by partially or wholly replacing barley with tapioca has been taken up. The results are encouraging. Studies on the influence of copper sulphate feeding on the reproductive performance of heifers indicated that the heifers receiving this supplement came into heat earlier than those not getting it. In calves suffering from vitamin A deficiency, intramuscular administration of vitamin A was found to increase the calcium, iron, copper and carotene contents of blood, thereby indicating improved mobilisation of these nutrients.

13.3 **Western Regional Animal Nutrition Station, Anand.** A survey was carried out in Madhya Pradesh to study the quantity and quality of cattle feeds and fodders available in relation to cattle population. Under this survey, the composition of available feeds, fodders and tree leaves was studied and the haemoglobin content in the blood of the animals was determined. Samples of by-products of maize, *tur* (*Cajanus cajans*), rice and *guar* (*Cyamopsis psoralioides*) were collected from factories and their compositions studied. The composition of jowar fodder was found to vary much more from village to village than wheat straw. On the whole jowar as fodders was found to be superior to wheat straw. The predominant grasses

in the areas were found to be *Therma guardrivalvia* (Gundardo) and *Sehima sulcatum* (Ponia). Of all the maize products, gluten was found to be the richest in protein (55 per cent), while maize grit had only 11 per cent of this ingredient. Limited trials with Russian Comfrey indicated that in composition it was similar to lucerne and *berseem*. No significant difference was observed in the haemoglobin content of the blood of Gir and Kankrej cows.

13.4 **Eastern Regional Animal Nutrition Station, Haringhatta.** Experiments with different fodder crops were carried out to select better and high-yielding crops. Samples of different crops at different stages of growth, under different manurial treatments and with different mixture combinations were chemically analysed to ascertain their nutritive values. In a manurial trial on *berseem* with different doses of phosphorus, potash and lime, the lime treatment was found to have a significant effect in increasing the yield. Under other investigations for selecting suitable grass-legume mixtures, several trials were conducted to find out their performance and suitability as fodder. Five mixtures were tried and the grass-legume seeds were mixed up approximately in the proportion 1:2. It was generally observed that during spring time the legume components of the mixtures were in a dominating position while in monsoon and autumn a reverse trend was noticed. The percentage of crude protein in different mixtures under different cuttings ranged between 6·03 and 13·27. The dry matter percentage ranged between 14·0 and 36·0.

13.5 **Indian Veterinary Research Institute, Izatnagar.** Studies were continued on the requirements of essential nutrients of pigs under Indian conditions and the effect of different nutritional levels on the quality of pig meat. Actual ingestion of DCP and TDN was determined in White Yorkshire pigs and correlated with their body-weight and growth rates.

14.0 Animal Diseases

14.1 A number of schemes relating to investigation of diseases of cattle, buffaloes, sheep, goats, pigs, camels and their control and on poultry problems are being implemented in almost all the States and at the I.V.R.I., Mukteswar and Izatnagar. An account of the progress made in the various schemes is given below:

14.2 **Brucellosis.** Investigations for controlling the disease in Uttar Pradesh, Bihar and Madras were continued. As a result of systematic work carried out in Uttar Pradesh, the incidence of the disease at the Government Farms was brought down from 6·0 per cent to 0·9 per cent. The survey to assess the incidence of the disease in other States was continued.

14.3 **Humpsore.** A co-ordinated scheme for the control and eradication of this disease in cattle is in operation in Orissa, West Bengal and Assam. Application of an ointment containing phenothiazine, D.D.T. and carbolic acid gave satisfactory results. Investigations to find out the life-history of the causal parasite are in progress.

14.4 **Contagious Bovine Pleuro-pneumonia.** A scheme for the control of contagious bovine pleuro-pneumonia is in operation in Assam since 1951. As a result of vaccination and control measures taken, Goalpara district which was once the main seat of infection is now free from the disease. The spread of the disease into the adjoining districts has also been prevented. Research work to evolve a more efficacious vaccine and more rapid method of diagnosis of the disease is in progress.

14.5 **Fascioliasis.** A number of schemes for the control of parasitic diseases especially liverfluke infestation, are in progress in Mysore, Bihar, Himachal Pradesh and Jammu and Kashmir. Under these schemes the infestations are controlled by regular administration of anti-parasitic drugs. As a result of mass-treatment, the incidence of the disease has been reduced considerably.

14.6 **General Disease Investigation Schemes.** Schemes of general disease investigation sponsored by the Council to investigate the etiology, mode of spread and control of infectious, non-infectious and obscure diseases have been in operation in most of the States for a number of years. This work has now been taken over on a permanent basis by the State Governments.

14.7 **Pigs.** Investigation of pig diseases is being carried out in Andhra Pradesh and the Punjab.

14.8 **Sheep and Goats.** A survey of the incidence of the diseases of sheep and goats was conducted in Rajasthan and Uttar Pradesh. Pneumonia in sheep and goats and certain obscure diseases, like contagious agalactia and lumbar paralysis, were also investigated.

14.9 **Cattle.** Disease investigation schemes for cattle are in progress in Rajasthan and Himachal Pradesh. A survey of contagious diseases of the livestock was conducted.

14.10 **Rinderpest Eradication Scheme.** The scheme was continued in Orissa, Bihar, West Bengal, Uttar Pradesh, Punjab, Jammu and Kashmir, Madhya Pradesh, Delhi and Rajasthan during the year. The work under the scheme has been completed in Bihar and West Bengal and is now being taken up in Gujarat, Tripura and Manipur.

14.10.1 During the year 1961-62, 118·36 lakh animals were vaccinated making a total of 1,058·26 lakh vaccinations since the inception of the scheme. Over 258 lakh doses of freeze-dried goat tissue vaccine were produced. To check the ingress of disease through the movement of animals from adjoining countries, 17 Land Quarantine Stations have been established in Uttar Pradesh, Bihar, West Bengal, Assam and the Punjab. A survey was conducted to establish more such stations.

15.0 Dairy Development

15.1 During the year, seven dairy research schemes have been in operation and out of them one was started newly. A brief account of all these schemes is as follows:

15.2 At the National Dairy Research Institute, further work was done under the scheme for standardisation of an accelerated oxidation test to determine the shelf-life of *ghee*. The results indicated that it depended on the initial induction period. The more the induction period, the less was the spoilage percentage in the *ghee* samples. It was also found that the processing of milk and the washing of cream reduced the number of unfit samples but heating tended to increase the spoilage.

15.3 The scheme for the development and standardisation of the methods for detecting adulteration and estimating major constituents of milk continued at the Panjab University. Under this scheme, Bachmann test for detecting the freezing-point of milk standardised last year, was compared with Hortvet cryoscopic technique and a close agreement was found between the two. Research during the year supported the earlier conclusion that the freezing-point of cow's and buffaloe's milk was nearly the same and that it did not vary with any variation of season in the Punjab. Similarly, very little change in the freezing-point with the change in the lactation period of the animals was noted. Other important research aspects related to the study of the effect of boiling or heating of milk on its freezing-point and inter-facial lesion of milk.

15.4 The scheme for the survey of chemical and bacteriological qualities of milk continued to function at Trivandrum (Kerala) and at Haringhatta (West Bengal). A new scheme for the survey of bacteriological qualities of milk was started in Cuttack.

15.5 The scheme for the preparation of Edam and Gouda types of cheese was continued at Aarey in Maharashtra. As a result of intensive studies, improvement in both the types of cheese has been achieved.

15.6 The scheme for studying the economics of specialised dairy farming under various conditions in India continued at the Bara Joint Farming Cooperative Society Ltd., at Patiala, Punjab. Under this scheme, specialised dairy farming as a system will be studied and types of farming evolved to suit a fixed set of conditions.

16.0 Sheep and Goat Breeding

16.1 With the object of increasing wool and sheep production, co-ordinated research schemes on a regional basis have been sponsored by the Council in all the States where sheep rearing is an important occupation. In the Himalayan Region, cross-breeding of the local flocks with the imported fine-wooled breed, mainly of the Merino origin, is being done. In the north Indian plains, selection from the existing breeds is being done for improving the quality of wool. In the Peninsular zone, sheep are primarily maintained for meat production and yield of coloured fleece. Research in improving sheep in this region aims at obtaining higher meat production and better fleece from the existing flocks. In the western zone of the Deccan Plateau, new breeds of sheep yielding white fleece are being evolved both by selection and cross-breeding. In the eastern region of the Peninsula, studies in the potentiality of the existing breeds for meat production are in progress.

16.2 **Himalayan Region.** Research schemes sponsored by the Council are in progress for evolving new fine-wooled breeds in the States of Jammu and Kashmir, Himachal Pradesh and in the hill districts of Uttar Pradesh. In Kashmir State two new strains of sheep, one originating from the Merino and the second by cross-breeding the local flocks with the Rambouillet rams have been evolved. The fleece of the cross-bred sheep weighs 3·5 to 4·0 lb., whereas the local sheep yield 1·5 lb. of wool. The cross-bred rams are being utilised for studying their usefulness in the village flocks. The progeny of the cross-bred rams located in the villages yield 30 per cent more wool for apparel. Similar work is being undertaken at the sheep-breeding farms at Sarahan, in Himachal Pradesh and at Pipalkote in Uttar Pradesh.

16.3 **Dry Northern Plains.** This region comprising Rajasthan, Gujarat, parts of Uttar Pradesh and the Punjab, has a number of distinct sheep breeds. Of the total wool produced in the country, it accounts for more than 55 per cent, the major portion of which is exported. The main defects of wool of this region are the presence of coarse kemps or brittle fibres and lack of uniformity of staple. Research in evolving new strains yielding uniform wool is being done at the sheep breeding farms established near Bikaner in Rajasthan and Patan in Mehsana district of North Gujarat. The present breeding programme aims at ascertaining the heritability of different attributes of wool quality of Chokla breed. The fleece of these sheep weighs 36 oz. and the wool quality ranges from 46's to 54's with a staple length of 3 to 4 inches. At the sheep farm at Patan, similar work is in progress on the Kutchi sheep. These sheep yield 2·5 lb. of wool with a quality ranging from 44's to 48's and with a staple length of 2·5 to 3 inches. Further research in the estimates of heritability of fleece characters is in progress. The data when analysed would indicate the methods of selection of breeding stock. Selective breeding among a flock of Bikaneri sheep is in progress at the Livestock Farm, Hissar. At present, this flock is yielding 4 to 5 lb. of fleece of a superior lustrous quality.

16.4 **Deccan Plateau.** In the western zone of the Deccan Plateau, the research work aims at breeding white fleece strains by selection and cross-breeding. This work is mainly undertaken at the Sheep Breeding Farm, Poona, and at Ootacamund. Two strains of fine wool type are being evolved at the Sheep Research Station at Poona. A cross-bred flock originating from the Merino is being interbred. Selected rams from this strain are yielding 6 to 8 lb. of fine wool, while the average yield of the flock is 3·5 lb. as compared with 14 oz. obtained from the local sheep. Breeding of a second strain resulting from the mating of the local sheep with the imported Rambouillet rams is in progress. Cross-bred rams are being used in the village flocks for studying the improvement effected. The progeny born from these rams yields white fleece of better quality, although the fibre composition is not uniform.

16.4.1 Breeding of a small flock of imported Romney Marsh sheep and cross-breeding of the Nilgiri ewes with the Romney Marsh rams are the two main items of work undertaken at Ootacamund. The Romney Marsh flock is thriving at this farm and the cross-bred progeny is yielding superior medium quality wool.

The Nilgiri ewes weigh 40 to 45 lb. while the cross-bred Romney ewes weigh 60 to 70 lb., yielding 3 to 4 lb. of wool as against 1 lb. of wool obtained from the local sheep.

16.5 **Eastern Region.** In the eastern zone of the Peninsula, research to study the potentiality of the important mutton breeds of sheep has been undertaken in the States of Andhra Pradesh and Madras. Out-standing rams of the breeds of Barmur, Nellore, and local Madras sheep are being selected through progeny testing.

16.6 **Goat Breeding.** Trials on cross-breeding of the local goats with the Angora bucks have been undertaken in the States of Himachal Pradesh, Uttar Pradesh and Maharashtra. The Angora goat yields valuable lustrous hair and is not a browser. The character of yielding mohair is transmitted to the second generation of graded progeny.

17.0 Hides and Skins

17.1 A fresh scheme to improve the leather-making qualities of raw hides and skins obtained from dead animals was initiated at the Central Leather Research Institute, Madras. Suitable processes for treating hides and skins with certain preservatives immediately after flaying so as to check the possible temporary damage before these are put to curing are to be worked out. Besides, the scheme also aims at evolving cheap and easily available preservatives.

18.0 Poultry Breeding

18.1 The Council continued to finance schemes of research in poultry husbandry, including housing, feeding and poultry technology which are being operated in the various States and at the I.V.R.I.

18.2 A new scheme to investigate the possibility of developing the day-old-chick industry by raising the chicks under village conditions was started at the Agricultural Institute, Katpadi. It aims at a target of 45,000 day-old chicks in three years. The eggs are obtained both from the Institute farm as well as from the rural units. During the year, over 10,000 healthy chicks were hatched and distributed in the villages for rearing. Coops were also provided to the people in the villages at a nominal price. The main problem encountered in rearing day-old chicks in the villages was cannibalism. This is being overcome by the adoption of suitable measures.

18.2.1 The scheme on cheap poultry houses which aims at studying the effects of different types of houses (built from locally available material) on the growth, health and productivity of birds continued in Uttar Pradesh, Madhya Pradesh, Andhra Pradesh and Orissa and terminated in Madras and Bihar. The results indicate that bamboo houses in Madras and *mitti* houses in Bihar can be adopted for keeping poultry with advantage. In Uttar Pradesh, preliminary results

show that mud houses, hanging houses and wire-netted houses are comparatively strong as well as safe from predatory birds and animals.

18.3 Very useful results have been achieved under the Council's scheme at Hyderabad for broiler production. A quick-growing strain of White Rock chicks imported from Israel achieved an average weight of 3·31 lb. in ten weeks. The Council has sanctioned another scheme for multiplication of the broiler strain at Sarurnagar farm in Andhra Pradesh. Its main object is to multiply and preserve the broiler stock by distribution to other States.

18.4 Research schemes for the development of ducks have been sanctioned in the Punjab and Kerala States. The object is to evolve suitable egg-laying strains of ducks and to distribute them in suitable areas. Investigations are being made to study incubation, rearing, nutrition and disease problems connected with duck breeding and also to undertake an experiment on upgrading the local ducks with pure-bred drakes.

18.5 In West Bengal, a scheme has been sanctioned for studying the scope and economics of keeping poultry in batteries for commercial egg production. The results achieved so far indicate that under identical conditions the Rhode Island Red performs better than the White Leghorn when the birds are kept in cages.

18.6 In order to determine cheap poultry rations, a co-ordinated scheme has been sanctioned in Madhya Pradesh and the Punjab. It aims at studying the effect of inclusion of certain locally available and cheaper grains or their by-products on the growth, mortality, efficiency of food utilisation in growing chicks, and their effect on the average age of maturity, egg production and hatchability. Under the scheme in the Punjab, it was observed that the grains in standard mash, i.e., barley and maize could be easily replaced by maize products and rice polish, with considerable benefit to growing stock. Similarly, fish meals can be replaced by cheap meat meal which is also more palatable. The quantity of meat meal can be reduced with advantage to five per cent level for mash for growing stock when it is fed along with *Penicillium* mycelia and corn gluten. *Penicillium* mycelia also appear to be a useful ingredient for poultry mash as a source of protein and Vitamin B-12.

19.0 Apiculture

19.1 Investigations on breeding better type of bees capable of producing more honey were taken up at the Regional Bee Research Station in Himachal Pradesh. Trials on the use of substitutes for pollen during the lean periods were also conducted. Similar work is also being done under a separate scheme at Rajendranagar in Andhra Pradesh.

20.0 Pisciculture

20.1 Four schemes on pisciculture, one in Uttar Pradesh, two in West Bengal and one in Maharashtra, remained in operation during the year. Research

on fish ecology was undertaken in Uttar Pradesh. Sixty-six varieties of fish have been identified and their habitats and food habits studied. In West Bengal, investigations into the causes of loss of freshness in fish during storage and transport were carried out. Spoilage index of the fish treated with different chemicals was also studied. The scheme for the sample survey to determine the effects of mechanisation of fishing craft in Maharashtra was in progress.

21.0 Statistical Research

21.1 The Institute of Agricultural Research Statistics continued to carry on fundamental and applied research in agricultural statistics and impart post-graduate and inservice training in agricultural and animal husbandry statistics. It also continued its advisory work on statistical aspects relating to the design and layout of agricultural and animal husbandry experiments, and the interpretation of their results, examination of the technical programmes, annual progress and final reports of the Council's schemes. About 20 papers dealing with the research investigations carried out at the Institute were published in scientific journals.

21.2 Agricultural Experimentation

21.2.1 Co-ordinated Agronomic Trials. Under the scheme, complex factorial experiments on selected 15-acre blocks leased by the Government from the cultivators and simple trials on farmers' fields were conducted.

21.2.2 Model Agronomic Experiments. During the year, 73 experiments in *kharif* conducted in 1959-60 and 84 in *rabi* conducted in 1959-60 were analysed. Data of about 120 experiments laid out in 1960-61 were obtained and their statistical analysis is in progress.

21.2.3 Simple Fertiliser Trials. During the year, about 13,000 trials were laid out in cultivators' fields spread over 140 districts of the country. The yield data of trials conducted in 1960-61 were also received. The statistical analysis of all the experiments conducted during 1959-60 was completed and the report is under preparation.

21.2.4 Fertiliser Demonstration Trials. Under this scheme which was initiated in the year 1954-55 in collaboration with the Technical Co-operation Mission of the United States of America, results of about 3,200 demonstration trials in *rabi* 1958-59 and of 3,500 demonstrations in *kharif* 1959-60, were analysed and reports prepared. Results of about 6,000 demonstrations conducted in 1960-61 and of those conducted during the present year have been received.

21.2.5 National Index of Field Experiments. This scheme was started in October, 1955 with the object of collecting and maintaining the data at a central place of all agricultural field experiments conducted in the country since 1935. So far, data of about 19,000 experiments conducted during the period 1935-49 have been collected by the special staff posted in different States. Complete data for the period 1948-53 have already been collected and a compendium of the

results is under publication. Data for the later period are also being compiled and processed for the preparation of a similar compendium.

21.2.6 STANDARDIZATION OF HORTICULTURAL EXPERIMENTS. Under the scheme, data relating to uniformity trials and agricultural experiments are being collected from different States, Central Research Stations and Institutes on horticultural crops. During the present year, data on cabbage, *knol khol*, *bhindi*, tomato and citrus from Jammu and Kashmir, Maharashtra, Madhya Pradesh and Mysore were collected. Study on the optimum size and shape of plots and blocks for the tomato crop received from Silari Farm, Madhya Pradesh, is being made.

21.3 Operational Research and assessment Surveys

21.3.1 YARDSTICKS AND AGRICULTURAL PRODUCTION. At the Institute, work is being done on request by the Planning Commission for the formulation of yardsticks of additional production by the use of fertilisers, manures, irrigation etc. These yardsticks were further brought up-to-date while the study of the formulation of composite yardsticks of farmyard manures with fertilisers continued to progress.

21.3.2 ESTIMATION OF INCIDENCE OF DISEASES ON RICE CROP. This scheme was started in the Cuttack district of Orissa in June, 1959, and is proposed to be continued up to 30th June, 1962. A similar survey with identical objectives has been started in Tanjore district of Madras State this year. Statistical analysis of data collected during *sarad* season of 1959-60 was completed, and for *dalua* crop of 1959-60 and two seasons of 1960-61, analysis is being carried out.

21.3.3 COST OF MILK PRODUCTION. For evolving a suitable sampling technique which would lead to an objective assessment of the cost of production of milk in the urban, suburban and typical rural areas, two surveys, one in Delhi (1953-55) and the other in Madras (1957-59) were completed. The third one in Calcutta and in a rural area of West Bengal commenced in January, 1960 for which field work was completed in March, 1962. The results of the first year of the enquiry have been presented to the *ad hoc* Milk Costing Committee.

21.3.4 DATA ON BACTERIOLOGICAL QUALITY OF MILK. The Council sanctioned schemes for studying the bacteriological quality of milk supplied to some of the important cities. These schemes were completed in Delhi, Anand and Allahabad and are currently running at Trivandrum, Haringhatta, Jaipur and Cuttack. The final report of the results of the statistical analysis of the data collected in the Delhi scheme has been presented to the Scientific Committees.

21.3.5 COST OF POULTRY AND EGG PRODUCTION. The enquiry aims at examining the feasibility of adopting various schedules prepared by the Institute, to record data, to ascertain the cost of poultry and egg production, and to obtain a broad idea of the contribution of the different items to the total cost. This enquiry was completed at the ten selected farms and the data collected are being processed.

21.3.6 RINDERPEST ERADICATION SCHEME. As reported earlier, a campaign of mass vaccination of cattle and buffaloes for controlling rinderpest disease is in operation on a country-wide scale. Statistical assessment of work done in the

various States has been carried out from the weekly returns received from the field staff of States.

21.3.7 Wool Trials of Magra Breeds in Rajasthan. The object of the scheme is to examine the feasibility of grading wool by laboratory tests, and for ascertaining its economic implications, and evaluating the quality of different grades and putting these grades to manufacturing tests. Representative samples of fleeces from the tract have been collected and observation on staple length, fibre length, medullation percentage and crimps are being recorded.

21.3.8 Analysis of Breeding Data. The statistical analysis of: (a) data collected under the Sheep Breeding Scheme, Poona, and (b) of cross-bred cows and buffaloes collected at the Military Dairy Farms continued during the year.

21.4 **Training.** In the examinations held during the year, 11 students were declared successful in the professional statisticians' Certificate Course, 13 in the Senior Certificate Course and nine in the In-service Training Course. Thesis of 11 students were accepted for the award of Diploma in Agricultural Statistics.

21.4.1 The number of students admitted to the Diploma, Professional Statisticians' Certificate, Senior Certificate and In-service courses was 9, 16, 18 and 10 respectively.

21.4.2 Mr. Alexander Le Roux from the Federation of Rhodesia and Nyasaland and Mr. Iskander F. Coubrousli from Jordan underwent training in Agricultural Statistics for a period of nine months each under the Expanded Technical Assistance Programme of the F.A.O. Mr. M. A. Bedawai, special trainee from the Sudan, completed his three years' training at the Institute and submitted his thesis for the award of Diploma in Agricultural Statistics. Mr. Abib Mutawalli of Iraq received special training in Designing and Analysis of Agricultural Experiments for about two weeks under the T.C.M. Programme while Mr. U. Chit Hlaing from Burma received training in Agricultural Statistics for a period of about six months under the Colombo Plan.

21.4.3 The Institute continued to impart training in prescribed courses in statistics for the students of the Post-Graduate School of the Indian Agricultural Research Institute.

21.5 A list of other schemes and surveys in progress during the year is given below:

(1) Cultivation cost of cotton, oilseeds and rotation crops; (2) study of economics of bunding in Maharashtra; (3) economics of irrigation in Coimbatore; (4) study of social and economic conditions of people in Ghataprabha left bank canal areas; (5) survey to determine effects of mechanization of fishing craft in Maharashtra; (6) study of factors influencing cropping pattern of individual holdings in Uttar Pradesh, Punjab, Bihar and Andhra Pradesh; (7) survey of fertiliser practices; (8) pilot sample surveys on cashewnut and cardamom crops; (9) study of feeding and rearing practices of sheep and yield of wool; (10) milk yield, breeds, feeding and management practices of cattle and buffaloes; (11) bench mark and assessment survey under the Intensive Agricultural Programme; (12) Pilot scheme for Research Project files.

22.0 Publications and Information

22.1 The Publication Wing of the Council issued 47 publications including ten monographs, seven books, eight reports and 22 bulletins. The Council continued to publish ten periodicals on various aspects of Agriculture and Animal Husbandry, and brought out 54 issues of the different periodicals.

22.2 At present, 54 publications are under print; manuscripts of 98 publications are being processed for publication by the editorial staff and manuscripts of 134 publications are awaited from authors.

22.3 **Agriculture Information Service.** Under the Agriculture Information Service started last year, 240 releases were issued to the press in Hindi, Tamil, Telugu, Kannada, Bengali, Marathi, Gujarati, Punjabi, Urdu and English. Special feature articles with reference to particular regions, seasons and crops grown were also issued under this Service. The number of journals using the Council's Agriculture Information Service now works out to 206 per month with an estimated total circulation of 2·1 million copies per month.

22.4 **Sales and Distribution.** A total revenue of Rs. 5,35,231 was earned from the sale of publications. The total revenue from advertisements published in the Council's journals was Rs. 1,08,397 as against Rs. 71,960 during the previous year.

22.5 Library

22.5.1 Acquisitions. During the year under report, 930 books, 520 reports, 3,200 bulletins and 600 periodicals were added to the library.

22.5.2 Service. As many as 5,850 readers visited the Library during the year. The number of publications issued on loan was about 4,500. Inter-library loan facilities were extended to a number of libraries in and around Delhi. Over 3,000 queries received on different subjects were answered. Bibliographies on a few specific subjects were also compiled on request.

23.0 Commodity Committees

23.1 Indian Central Arecanut Committee

23.1.1 The Indian Central Arecanut Committee continued to organise agricultural and technological research on arecanut during the year. About 88,150 quintals of betelnut valued at Rs. 39,86,464 were imported till February, 1962 to supplement internal production. To increase production of arecanut and improve its quality, the Central and Regional Arecanut Research Stations under the Committee continued to intensify studies on the exotic and indigenous areca varieties, their breeding and hybridization and standardization of cultural and manurial practices. Investigations on the control of arecanut diseases like yellow leaf, *band*, *Hidimundigay Roga*, *Anabe Roga* and *Mahali* were also pursued further.

23.1.2 The Arecanut Technology Unit at the Central Food Technological Research Institute, Mysore, made further progress in investigations on the nut and its by-products. A ' Thru-Flu ' type of mechanical drier, expected to be very economical to operate, was designed and fabricated.

23.1.3 Investigations on the technology of arecanut and its by-products under schemes sponsored by the Delhi and Gauhati Universities were continued. The possibility of utilising arecanut husk in the preparation of plastics, hardboards and wrapping paper was revealed under the schemes sponsored by the Forest Research Institute. Cooperative marketing societies dealing in arecanut continued to improve with financial aid from the Committee. Supply of fertilisers and fungicides was continued.

23.1.4 The work under the Pilot Sample Survey Scheme for correct estimation of area and production of arecanut was carried out in Kerala, Mysore, Assam, Madras, Maharashtra, Andhra Pradesh, and Orissa. The layout of the scheme for West Bengal was finalized for implementation in 1962-63. The report on the first round of surveys under the Sample Survey Scheme and the preliminary report on the Pilot Scheme for the study of cost of cultivation of arecanut in Mysore were adopted.

23.1.5 New schemes on arecanut development programmes sanctioned under the Third Five Year Plan are in the initial stages of implementation. As many as 16,02,077 seedlings, raised from the various categories of nursery units of the Second Five Year Plan were distributed to the ryots in Kerala, Mysore, Assam, West Bengal, Andhra Pradesh, Orissa, Madras, and Andaman and Nicobar Islands. The simple manurial trials in ryots' gardens laid out in Kerala, Mysore, Assam, and West Bengal in coastal, sub-montane and plain regions were continued. Trials were also laid out in the vicinity of the Central and Regional Research Stations.

23.2 Indian Central Coconut Committee

23.2.1 The Central Coconut Research Stations at Kasaragod and Kayangulam in Kerala continued work on exotic varieties, hybridization, cultural and manurial aspects, pests and diseases of coconut. Soil survey to determine suitable tracts for growing coconut was continued. Studies on the storage of copra and coconut oilcake were pursued.

23.2.2 The Research Stations in Kerala, Mysore, Madras, Andhra Pradesh, Maharashtra, and Assam continued to function and attend to regional problems.

23.2.3 One hundred and six nurseries with an annual production target of 13·61 lakh of seedlings, received financial support from the Committee and the Government of India. Besides, the Committee's own nursery with a production target of 10,000 seedlings continued to function.

23.2.4 Zonal parasite breeding stations for the multiplication of the parasites of the pest *Nephantis serinopa* were functioning in Kerala, Mysore, Madras, Andhra Pradesh and Maharashtra. Schemes for the investigation and control of diseases of coconut were in operation in Mysore, Andhra Pradesh and Maharashtra.

23.2.5 The third round of pilot surveys for the correct estimation of area and yield of coconut was in progress in Kerala, Mysore, Madras, Andhra Pradesh and Maharashtra. In Assam, the fourth round was started in October, 1961, while the first round of the survey was continued in Orissa.

23.3 Indian Central Cotton Committee

23.3.1 During 1961-62, the Indian Central Cotton Committee in collaboration with the State Governments and other institutions, financed 59 research schemes for the (1) evolution of improved varieties of cotton; (2) determination of optimum agronomic schedules for maximising yields; and (3) control of pests and diseases. Besides, 14 seed multiplication and distribution schemes were also financed to facilitate the rapid spread of pure seed of improved varieties, in the different tracts. The important results obtained from these schemes are summarised below.

23.3.2 Two new strains viz., Y-1 and Nandicum (5975) were recommended for general cultivation in the Khandesh tract of Maharashtra and northern tract of Andhra Pradesh, respectively. The cultivation of Nandicum is anticipated to result in an additional monetary return of Rs. 11 per acre over that of the existing strain.

23.3.3 Agronomic investigations conducted in the Punjab indicated that application of nitrogenous fertilizers evoked good response in yield at Abohar and Hansi. For doses varying from 25 to 125 lb. of N per acre, the net additional income from the increased yield ranged from Rs. 57·50 to Rs. 126 at Abohar and from Rs. 43·50 to Rs. 140·50 at Hansi.

23.3.4 A schedule has been recommended for adoption by the cultivators for raising a fairly pest and disease-free cotton crop.

23.3.5 A total area of 564 acres has been estimated to be covered by hybrid cotton in 1961-62 in the four districts of Ahmedabad, Mehsana, Kaira and Sabarkantha of Gujarat. The cultivation which extended over an area of 101 acres during the previous year yielded in all about 77 bales. The mill tests conducted on the produce of that year indicated that the hybrid cotton possessed length, fineness and strength to spin 90-120s, except for its excessive neppiness and wastiness compared with the imported Sudanese cotton.

23.3.6 During the present year, Andrews extra long staple cotton was cultivated over an aggregate area of about 2,995 acres—in Kerala 750 acres, in Mysore 2,124 acres, in Madras 75 acres and in Andhra Pradesh 46 acres. In all, about 315 bales are expected from this season's crop. The first quality *kapas* from the Kerala has been tendered at the rate of Rs. 2·30 per Kg. During 1962-63, it is proposed to cover 10,000 acres in Mysore, and about 1,200 acres in Kerala, 500 of which are to be reclaimed by tractor ploughing in the Palghat district and the remainder in the Kozhikode and Trichur districts. A comprehensive programme for undertaking exploratory trials in Andrews cotton in Punjab, Uttar Pradesh, Maharashtra, Gujarat, Andhra Pradesh and Madras has been drawn up for implementation in the next year.

23.4 Indian Central Jute Committee

23.4.1 AGRICULTURAL RESEARCH. At the Institute, the perfect form of *Rhizoctonia bataticola* (Taub.) Butler, has been found to bear apothecia containing asci and ascospores. Ascospores germinate to produce typical cultures of *Rhizoctonia bataticola*. This perfect form has been indentified as *Orbilia obscura* sp.

23.4.2 A new hybrid strain of the Tossa *C. olitorius* variety of jute which can be sown early practically about the same time as the White *C. capsularis* variety, has been successfully evolved. Work on interspecific crosses between *C. capsularis* and *C. olitorius* was continued.

23.4.3 It has been found that in red soils with low *p*H, a basal dressing of lime and application of potash can definitely reduce the incidence of stem rot and root rot.

23.4.4 A combined chemical and micro-biological technique has been evolved for degumming and retting of ramie.

23.4.5 Technological Research process has been evolved by which pulp suitable for box boards can be obtained from jute sticks with about 75 per cent yield, using lime as the pulping agent and a disc refiner for disintegrating the partially digested material. Jute sticks are being used by some paper mills for making box boards.

23.4.6 To avoid contamination of wool with loose jute fibre from wool packs, a process has been evolved for improving the wool pack with the application of a thin coat of rubber latex on its inner surface. Samples have been sent to Australia and New Zealand for actual trials. Preliminary experiments have shown that rayon-grade pulp can be obtained from jute sticks. These improved jute bags for wool pack do not cost more than the usual bags.

23.4.7 ECONOMIC RESEARCH. Investigations carried out at ten selected centres have given the average cost of production of jute as Rs. 21·71 and that of paddy at Rs. 9·08 per acre. These estimates based on a small size of sample are not representative. A comprehensive survey on an adequate size of the sample has been drawn up. Studies on the comparative economics of jute cultivation under the improved and the traditional methods have revealed that with an additional investment of ten per cent under the improved method, there is a gain of more than 32 per cent in output. It also reduces the unit cost of jute production by about 17 per cent.

23.4.8 DEVELOPMENT. *The Grow More Jute* campaign was carried out in all the six jute-growing States and a record crop of jute was produced during the year as a result of increased area put under cultivation and by adoption of improved agricultural practices, the area and production being 22·59 lakh acres and 62·69 lakh bales, respectively. In addition, mesta production was estimated at about 17 lakh bales.

23.4.9 In all, 13,932 maunds of improved jute seed was distributed in 1961-62, as against 11,053 maunds during 1960-61. The area under line-sowing increased from 25,960 acres during the previous year to 44,040 acres, while the fertilisers distribution increased from 12,910 tons to 25,297 tons in 1961-62.

23.4.10 There was widespread attack of hairy caterpillars and semi-loopers in different States. Plant protection measures were taken to control the attack of these insect pests over 2,25,000 acres in West Bengal, 40,000 acres in Assam, 20,000 acres in Bihar and 5,000 acres each in Uttar Pradesh and Orissa.

23.4.11 At the extension centres round the Central Station and in the Jute Development Blocks in Bihar, Assam, Uttar Pradesh and Orissa, demonstration on improved methods of jute cultivation was intensified.

23.5 Indian Central Oilseeds Committee

23.5.1 The Committee sanctioned 14 agricultural research schemes for the evolution of improved strains of oilseeds etc., in Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Uttar Pradesh, Bihar, Madras, Mysore, Maharashtra and Orissa, at a total expenditure of Rs. 23 lakh to be incurred over a period of four years.

23.5.2 Technological Research. Fourteen projects on technological research on vegetable oils, sanctioned during the Second Five Year Plan were continued.

23.5.3 The results obtained under the projects on 'Cottonseed Oil', 'Castor Oil' and 'Activated Earths' at the Regional Research Laboratory, Hyderabad, have been recommended for dissemination for the benefit of industry.

23.5.4 Integrated Oilseed Development Schemes. In the Third Five Year Plan, a production target of 98 lakh tons of oilseeds by 1965-66, has been fixed by the Planning Commission. With a view to enable the States to achieve it, Integrated Oilseed Development Schemes have been sponsored in various States at an estimated cost of Rs. 266·7 lakhs.

23.5.5 Package Programme for Groundnut Production. The Committee sanctioned Package Programme schemes for increasing production of groundnut in Andhra Pradesh, Gujarat, Madhya Pradesh, Madras, Maharashtra, Mysore and Uttar Pradesh involving an expenditure of Rs. 15,19,325 spread over a period of four years, with effect from 1st April 1962.

23.6 Indian Central Tobacco Committee

23.6.1 The Committee continued research on various types of tobacco at its research institute and stations and sub-stations, besides operating a number of schemes in conjunction with the State Governments and other institutions.

23.6.2 East Godavari Area. Results of economic importance were obtained in the following items of work: (1) chemical analysis of the soil samples; (2) effect of crow-barring and mulching; (3) application of phosphorus as a basal dose; (4) effect of light on the germination of tobacco seed; (5) influence of Ca and Mg on the yield of tobacco; (6) studies on fading of colour; (7) chemical analysis of leaf samples; (8) variety 'Delcrest' of F.C.V. and improved selections of lanka tobacco; (9) control of 'Root-knot' incidence and control of 'Orobanche' by allyl alcohol; and (10) control of ground beetles.

23.6.3 GUNTUR AREA. Inorganic fertilisers like urea and calcium ammonium nitrate proved to be as good as commonly used ammonium sulphate. Delcrest was found to be a better variety than Chatham and Harrison special. For *Natu* tobacco, manuring with ammonium sulphate proved better than that either with groundnut cake or with a combination of both in equal proportions.

23.6.4 VEDASANDUR AREA. Karuvazhai Selection I-452 and Selection I-64 were found very promising.

23.6.5 PUSA AREA. The following items of research yielded results of economic importance in the experiments conducted in the area: (1) nursery experiment on the control of earth-worms, (2) manuring experiments in the field on *hookah* and chewing tobacco, and (3) rotation of tobacco by tobacco.

The improved variety D.P. 401 proved to be superior to other varieties.

23.6.6 DINHATA AREA. The following trials yielded results of economic importance: (1) the application of 28 Kg. N/ha as ammonium sulphate along with 20 cartloads of farmyard manure per ha; (2) for Motihari tobacco (*Nicotiana rustica*) use of complete fertiliser (NPK) was found to be preferable to that of N alone.

23.6.7 HUNSUR AREA. From the nursery experiments conducted, the following tentative conclusions could be drawn:

(1) Paddy straw shed was superior to *thatti* cover; (2) seed rate of 3·36 Kg./ha of nursery was optimum; (3) rabbing the beds and mixing with top soil was beneficial, (4) 200 carts of f.y.m. per ha mixed with the top soil were found superior to lower doses of f.y.m. as well as its application as a layer; (5) all the insecticides tested proved to be equally effective in controlling aphids on cigarette tobacco.

23.6.8 ANAND AREA. Some useful results were obtained in the trials held in this area in the following cases:

(1) Plough-drilling method was found to be better than the broadcast method locally adopted; (2) ammonium sulphate and urea gave a higher yield of tobacco than Chilean nitrate and groundnut cake; (3) spot application of Shell-DD was found to be the best to control nematodes; (4) Bordeaux mixture, Fytolan, Shell Copper, Kirti Copper, Blitox-50, Banacobre, Cupproxol, Cupramar and Miller '658' controlled the damping-off disease effectively; (5) the incidence of the 'Pan sukaro' disease was much less in the irrigated plots than that in the non-irrigated plots; (6) maleic hydrazide, naphthalene acetic acid and castor oil (ten per cent emulsion) were found to be effective in controlling both axillary as well as ground suckers. However, maleic hydrazide suppressed the growth and yield considerably.

23.6.9 NIPANI AREA. The following results were obtained in the experiments conducted in the area; (1) raising seedlings on elevated beds with 2″ farmyard manure layer (well-seived) and use of Bordeaux mixture (2:2:50) against 'damping-off' disease gave more transplantable seedlings; (2) application of 60 lb. per acre of nitrogen after three weeks of planting was found to be better.

23.6.10 FEROZEPUR AREA. The two improved types, T. 238 of Kalkattia tobacco and T. 17 of *Desi* tobacco, continued to be popular with cultivators. C. 302 proved to be a new promising variety.

23.6.11 DEVELOPMENT AND TRAINING. The Central Tobacco Research Institute, Rajahmundry, distributed 4,275 Kg. of pure and processed seeds of Delcrest, Harrison Special, Virginia Gold, D.R. 1 and White Burley tobacco to the cultivators of Andhra Pradesh. About 45 lakhs of seedlings of improved varieties were also distributed to tobacco growers.

23.6.12 Cigar and Cheroot Tobacco Research Station, Vedasandur, provided 52,250 numbers of seedlings and 158·6 Kg. of seed of improved types for distribution to the cultivators in that area.

23.6.13 Cigarette Tobacco Research Sub-Station Guntur and *Hookah* Tobacco Research Sub-Station, Ferozepur produced 1,750 Kg. and 488 Kg. of seed respectively, and distributed it among the tobacco growers of the areas.

23.6.14 Wrapper and *Hookah* Tobacco Research Station, Dinhata supplied 2,36,284 Jati and 1,09,220 Motihari seedlings to the cultivators in West Bengal.

23.6.15 The *Bidi* Tobacco Research Scheme, Anand, provided 5,000 Kg. of seed and 34,91,000 seedlings to the ryots of Gujarat State.

23.6.16 The free training on improved methods of tobacco cultivation, handling and curing at the Central Tobacco Research Institute, Rajahmundry, the Institute of Agriculture, Anand, and at the *Bidi* Tobacco Research Sub-Station, Nipani, was continued.

23.6.17 PUBLICITY. The Committee continued to publish five Quarterlies; 'Indian Tobacco' and 'Tobacco Bulletin' in English, 'Tambaku' in Hindi, 'Pogaku' in Telugu and 'Tamaku' in Gujarati and also brought out 15 leaflets, seven in English, five in Telugu and one each in Hindi, Bengali and Tamil.

23.7 Indian Lac Cess Committee

23.7.1 As a result of a conference, the State Trading Corporation set up purchase centres to maintain buffer stock of seedlac, thereby raising the prices of lac in relationship with the minimum export prices.

23.7.2 EXPORTS. As a result of low prices, as well as low production of stick-lac, the exports during the year fell in value by approximately Rs. 2 crores. The exports were to the extent of Rs. 4,60,00,000, as against approximately Rs. 6,50,00,000 of the previous year and an average of Rs. 8,60,00,000 based on the averages of the last ten years. The production of lac during the year under review was 10,23,000 maunds.

23.7.3 At the Indian Lac Research Institute, Namkum, further trials on the new lac host, *Moghania macrophylla* produced good results and this lac host is being propagated in plantation and other forest areas.

23.7.4 Studies were conducted on the storing of bleached lac, making de-waxed bleached lac and on the development of a rapid method of hypochlorite bleaching of lac.

23.7.5 Lac-based etch-primer single pack gave satisfactory performance and its commercial manufacture will be commenced shortly. Shellac-based anti-mould varnish which proved satisfactory for book covers was given large-scale trials.

23.7.6 'Reconstituted Lac' was prepared and it is proposed to patent this process.

23.7.7 Shellac-based hydraulic-bed material has been further improved by incorporation of five per cent paraformaldehyde.

23.7.8 Forty-eight persons deputed by various State Governments completed six months' training in lac cultivation and qualified for Indian Lac Cess Committee's Certificate of Proficiency. In addition, ten supervisors of the Committee were given a short course of lectures.

23.8 Indian Central Spices and Cashewnut Committee

23.8.1 With a view to securing an all-round development of spices and cashewnut, the Government of India decided to set up an Indian Central Spices and Cashewnut Committee under the aegis of the Indian Council of Agricultural Research. A grant of Rs. 10 lakhs annually would be placed at the disposal of the Council for the purpose of the Committee. The Committee will deal with all aspects of research, development and marketing of these crops and coordinate its several activities in an effective manner. The headquarters of the Committee would be located at such a place as the Committee might decide.

23.8.2 The specific functions of the Indian Central Spices and Cashewnut Committee will be to assist in the improvement and development of cultivation and marketing of spices and cashewnut, the production, manufacture and marketing of their by-products and all matters incidental thereto.

24.0 General: Practical Utility of Results Achieved

24.1 **Rice.** In Madras, drought-resistant strains of white rice were evolved by crossing cultivated rice with wild rice. Desirable dormant strains were also isolated.

24.2 **Wheat.** Seven strains of Gaza 39-1 were found uniformly resistant to stem rust. The strain 1-6-14-15-2 will be released for cultivation from Bijapur shortly.

24.3 **Maize.** The double-cross hybrids which have been released proved superior to the local Ganga 101 by 53 per cent; to Deccan by 51 per cent; to Ranjit by 42 per cent and to Ganga 1 by 22 per cent.

24.4 **Pulses.** In red grams, No. 29 from West Bengal was found to be highly wilt resistant. Selection No. 15 yielded 49 per cent more and No. 42 gave 19 per cent more yield than the local varieties in Andhra Pradesh. Similarly, Chafa was the best in yield and quality at Khargone (Madhya Pradesh). Selection A 56-73 in black gram yielded 40 per cent more than the local and matured earlier giving better quality of *dal*. It was released as *urid* Khargone-3. At Khargone, the bold-grained shining green-seeded early selection K-56-119 in green gram proved outstanding, yielding 20 per cent more than the local variety. Selections 7, 18 and 35 in horse-gram showed promise in Andhra Pradesh, yielding 41, 76 and 82 per

cent, respectively, more than their standards. At Coimbatore, Selection D.L. 2452 of *Dolichos lablab* proved outstanding with 32 per cent increase in yield of grain and 28 per cent grain in yield of green matter over the local.

24.5 **Fodder and Forage.** Fodder grasses invariably gave a higher response to nitrogenous manures, while legumes responded more to phosphate than to nitrogen.

24.6 **Green Manuring.** Legumes sown between rows of cotton and green-manured, when 40 days old, increased the yield of cotton in Poona and Mandya (Mysore).

24.7 **Weed Control.** Post-emergence spraying with 2,4-D irrespective of formulation, controlled most of the weeds in wheat.

Xanthium stumarium, a wasteland weed, was controlled by 2,4-D at 1 lb. per acre. Nutgrass was suppressed by higher doses.

24.8 **Agronomic Investigations.** A mixture of nitrogen and phosphate placed in a band at a depth of 2″ and 2″ away from the seed proved more effective than broadcast application in *kharif guar* and drilled paddy.

24.9 **Soil Science and Agricultural Chemistry.** Sugarbeet proved a promising crop in the Punjab for cultivation on saline soils in rotation with *dhaincha* and paddy. The acid soils of Kerala responded well to liming.

24.10 **Fertilizer Demonstration Scheme.** There was widespread response to nitrogen and phosphate. No significant differences were observed among responses to different forms of nitrogen.

24.11 **Simple Fertilizer Trials.** Maps showing areas giving varying degrees of responses to nitrogen, phosphate and potassium, have been prepared.

24.12 **Model Agronomic Experiments.** In areas responsive to phosphate residual effect of the order of 20 to 30 per cent of phosphate applied was observed. Localised application of phosphate deeper in the soil was superior to broadcast application.

24.13 **Fruit Research.** The following methods of control of weeds, pests and diseases, proved to be of practical significance; (i) Bihar Spray recipe of naphthalene acetic acid at 10 ppm. for reducing pre-harvest fruit drop in mango; (ii) Control of citrus leaf-miner with sprays of *neem*-cake water extracts at Kodur; (iii) Control of orchard weed flora at Kodur by monthly sprays of T.C.A. at 80 lb. per acre; (iv) Control of banana aphid in Kerala by the use of insecticides like Ekatin, Endrin, Metasystex or Basudin.

24.14 **Onion.** In Andhra Pradesh, Bellary Big proved superior in yield to 11 other promising types.

24.15 **Chillies.** A strain G-2 was isolated in Guntur. It is superior to G-1 and the local varieties, and gives 40 per cent extra yield. The fruits of G-2 are thrip-resistant and pungent.

24.16 **Tapioca.** The variety Valencia gave the highest yield among five other varieties.

24.17 **Cardamom.** Application of NPK mixture, 6:8:12, at 200 to 300 Kg. per acre gave very good results.

24.18 **Cotton.** The new strains, Y-1 and Nandicum were recommended for cultivation in Khandesh tract of Maharashtra and northern tract of Andhra Pradesh respectively. The yield of Nandicum variety is expected to return an additional income of Rs. 11 per acre over the existing strain.

Application of nitrogenous fertilizers at doses 25 to 125 lb. per acre gave an increased yield resulting in additional incomes ranging from Rs. 57·50 to Rs. 126 at Abohar and from Rs. 43·50 to 140·50 at Hansi.

24.19 **Jute.** A new hybrid strain of Tossa (*Corchorus olitorius*) which can be sown early like *C. capsularis* has been evolved.

24.20 **Tobacco.** Delcrest was found to be a better variety of tobacco than Chatham and Harrison Special at Guntur. Manuring with ammonium sulphate proved better for *Natu* tobacco than manuring with groundnut cake or a combination of both in equal proportions.

24.20.1 Karuvazhai Selection I-452 and I-64 were promising in the Madras State.

24.20.2 In the fertilizer trials in Anand area the following useful results were obtained: (1) Ammonium sulphate and urea gave higher yield of tobacco than Chilean nitrate and groundnut cake; (2) Spot application of Shell-DD controlled the nematode; (3) Bordeaux mixture, Fytolan, Shell Copper, Kirti Copper, Blitox-50, Bava Cobre, Cupproxol, Cupraman and Miller 658 controlled the damping-off diseases effectively.

24.21 **Moghania macrophylla.** A new host of lac, proved good and this host is being propagated in plantations and other forest areas.

24.22 **Animal Diseases.** The incidence of brucellosis in the U.P. State herds has been brought down from six to 0·9 per cent. Vaccination and other control measures adopted for combating contagious bovine pleuro-pneumonia in the Goalpara district of Assam, have now made that district almost free from the disease. Under the Rinderpest Eradication Scheme during the year, 118·36 lakh animals were vaccinated making a total of 1058·26 lakh vaccinations. Over 258 lakh doses of freeze-dried goat tissue vaccine were produced.

24.22.1 Treatment of Humpsore with an ointment containing Phenothiazine, D.D.T. and Carbolic Acid, gave on the whole better results.

24.23 **Animal Breeding.** It is seen that cross-bred progeny have higher milk production than their dams and they mature earlier. The supply of semen from centralised collection centre to distant places in a viable condition by air, rail, and road has been rendered possible. A Jersey farm for the supply of Jersey bulls, was set up in Mandi district, Himachal Pradesh, and selection in regard to the Kutchi, Marwari, Bikaneri and Chokla breeds have indicated that hairiness, fleece density and face covering are highly heritable characters and these findings can be used for the sheep improvement in the respective breed zones.

24.24 **Dairy Development.** At the National Dairy Research Institute, Bangalore, it was found that more the induction period, the less was the spoilage

percentage in the *ghee* sample. It was also found that the processing of milk and the washing of cream reduced the number of unfit samples but heating tended to increase spoilage.

24.25 **Animal Nutrition.** At the Animal Nutrition Research Station, Bangalore, the studies on the influence of copper sulphate feeding on the reproductive performance of heifers indicated that the heifer receiving this supplement came into heat earlier than those not getting it.

24.25.1 At the Animal Nutrition Research Station, Anand, limited trials with Russian Comfrey indicated that in comparison it is similar to lucerne and *berseem*.

24.25.2 At the Animal Nutrition Research Station, Haringhatta, trials on *berseem* with different doses of phosphorus, potash and lime showed that lime treatment had significant effect in increasing yield of dry matter. It was found that during spring time the legume component of the mixtures were in a dominating position, while in the monsoon season and autumn a reverse trend was noticed.

24.26 **Poultry.** Bamboo houses in Madras and *Mitti* houses in Bihar were found suitable for keeping poultry. Under a scheme to determine cheap poultry rations running in the Punjab, it has been found that several cheap locally available feeds can replace the feeds in standard rations with advantage.

Appendices

APPENDIX 1

List of New Schemes Sanctioned

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
	A. Agricultural Schemes	
1.	Interspecific and intergeneric hybridisation in *Phaseolus*, *Vigna* and *Dolichos*	Institute of Technology, Kharagpur
2.	Physiology of flowering	Allahabad University
3.	Physiological studies on crop plants	Sri Venkateswara University
4.	Improvement of buck-wheat in Lahaul and Spiti Valleys ..	Punjab
5.	Studies on the high plant nutrient absorbing capacity of *eupatorium odoratum*	Kerala
6.	Research on the Stackburn disease of rice	Kerala
7.	Breeding paddy varieties resistant to drought	C.R.R.I.
8.	Insect resistance in rice particularly stem borers and gallfly ..	C.R.R.I.
9.	Preparation of national register of improved strains of crops ..	I.C.A.R.
10.	Research on malformation of mango	I.A.R.I.
11.	Investigation on papain production	Madras
12.	Establishment of cashew research station in Maidan areas ..	Mysore
13.	Research on turmeric	Maharashtra
14.	Fifth All India Spices and Cashewnut Show, 1961-62 ..	I.C.A.R.
15.	Research on Kattee disease of cardamom	I.C.A.R.
16.	Study of wilt disease of pepper	Kerala
17.	Investigation into the micro-nutrient status of soils	Gujarat
18.	Studies on the organic matter and decomposition of added organic substances in alkali soils	Banaras Hindu University
19.	Studies on Anion exchange properties of soils	Panjab University
20.	Micro-nutrient status of the soils	Lucknow University
21.	Study in soil structure	Rajasthan
22.	Biological and physio-chemical studies in paddy soils ..	Madras

APPENDIX 1—Contd.

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
23.	Survey of the micro-flora of radio-active soils	Agricultural College, Vellayani
24.	Studies on the reclamation of saline soils	Kerala
25.	Studies on the occurrence of *Rhizobium bacterio-phage* and its effect on host legumes grown in Indian Soils	Bose Research Institute, Calcutta
26.	Agronomic research in irrigated areas	Kerala
27.	Studies on water quality and soil salinity problem ..	B. R. College, Agra
28.	Collecting basic information in respect of brown rot (ring disease) of Potato	Maharashtra
29.	Termite research	Maharashtra
30.	Studies on insect pests of field crops in relation to insecticidal and biological methods of control	Kerala
31.	All India Entomological Conference, 1962	I.C.A.R.
32.	Testing fungicides on a field scale in the control of plant diseases-Establishment of a Sub-Station	Andhra Pradesh
33.	Research on fungicides—Western Region at Poona	Maharashtra
34.	Establishment of a second centre of type culture collection of micro-organisms in the South	Madras University
35.	Biological control of San Jose Scale	Uttar Pradesh
36.	Study of micro-flora of rhizosphere	Gujarat
37.	Economising labour in man and animal-worked machinery and implements	K.A.D.College,Allahabad
38.	Study on the design of cowdung gas plant	Khalsa College, Amritsar
39.	Seminar on designs, development and testing of improved agricultural implements at Poona in October, 1961	I.C.A.R.
40.	Co-ordinated maize breeding scheme	Himachal Pradesh
41.	Seminar on green manuring	I.C.A.R.
42.	Seminar on plant protection	I.C.A.R.
43.	Investigation of the liopic acid in plant metabolism with radio-active tracers	Bose Research Institute, Calcutta
	B. Animal Husbandry Schemes	
44.	Investigation of toxic plants and herbs lethal to domestic animals in Punjab	Punjab
45.	Improvement of sheep and wool on regional basis—Polwarth breed of sheep	Uttar Pradesh

APPENDIX 1—Contd.

Sl. No.	Name of Scheme	Sponsoring/Government Authority
46.	Investigation into the factors responsible for yellow colouration of wool	C.L.R.I.
47.	Studies into various systems of breeding for hybrid vigour to increase egg and meat production	Uttar Pradesh
48.	Utilization of shark skin for making leather	C.L.R.I.
49.	Standardisation of curing, processing and sterilization of intestines of cows, goats and sheep for manufacture of sausage, casings, surgical sutures and guts	C.L.R.I.
50.	Standardization of curing, processing and sterilization of intestines of cows, goats and sheep for manufacture of sausage, casings, surgical sutures and guts	West Bengal
51.	Fundamental studies in physio-chemical properties of milk and milk products	Panjab University
52.	Specialised dairy farming	Institute of Agriculture, Anand
53.	Control of brucellosis	Orissa
54.	Control of brucellosis	Madhya Pradesh
55.	*Salmonella* infection in poultry	Orissa
56.	Investigation and control of pig diseases	Uttar Pradesh
57.	Investigation of *Salmonella* infection in animals	Punjab
58.	Poultry disease investigation	Rajasthan
59.	Appointment of assistant disease investigation officer (poultry) ..	Jammu and Kashmir
60.	Studies on mucosal disease with special reference to strains, diagnosis, prevention and control	I.V.R.I.
61.	Yellow disease of cattle	Assam
62.	Research on African horse sickness	I.V.R.I.
63.	Studies on the bio-chemical composition of fresh water fishes	Aligarh University
64.	Economic poultry ration	Andhra Pradesh
65.	Study of important physiological aspects of farm animals ..	Punjab
66.	Investigation on mineral metabolism in ruminants with the aid of radio-active isotopes	U.P. Agricultural University
67.	Research and development for the production of fodder and improvement of grassland farming	West Bengal
68.	Determination of the comparative yield of different improved perennial grasses etc., which can be grown in Jabbalpur ..	Madhya Pradesh

APPENDIX 1—Concluded

Sl. No.	Name of Scheme	Sponsoring/Government Authority
69.	Evolving a new breed of dairy cattle by crossing Hariana and non-descript Bengal cows with an exotic Jersey breed ..	West Bengal
70.	Grading up of non-descript cattle at Nasik with Jersey Breed ..	Maharashtra
	C. Other Schemes	
71.	Evaluation of various measures undertaken for increasing agricultural production	Madhya Pradesh
72.	Abstract service for the research workers in the field of agriculture and Animal Husbandry Statistics	I.C.A.R.
73.	Study of cultivation practices and yield of litchi in Muzaffarpur district of Bihar and apple in Kangra and Simla districts of Punjab and Mahasu district of Himachal Pradesh	I.C.A.R.
74.	Sample survey for obtaining reliable quantitative data on utilisation of irrigation facilities by the farmers in Madras State ..	Madras
75.	Publication of the quarterly journal ' Agricultural Research ' ..	I.C.A.R.
76.	Award of five assistantships to students at the Institute of Agricultural Research Statistics	I.C.A.R.

APPENDIX-2

List of Current Schemes Granted Extension

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
	A. Agricultural Schemes	
1.	Pulse improvement	Assam
2.	Pulse improvement	Andhra Pradesh
3.	Cytological, Anatomical and embryological studies on crop plants	I.A.R.I.
4.	Investigation into smut disease of *bajra* in Gujarat	Institute of Agriculture, Anand
5.	Establishment of high altitude exploratory research farm in Jammu and Kashmir	I.C.A.R.
6.	Scheme for breeding and evolution of rice strains resistant to piricularia disease and work on spring rice in flooded areas of Collair	Andhra Pradesh
7.	Bacterial blight of paddy	Maharashtra
8.	Research on deep water paddy	Uttar Pradesh
9.	Improvement of hill paddy	Uttar Pradesh
10.	Breeding non-lodging, non-shedding and flood-resistant varieties of paddy	Madhya Pradesh
11.	Induction and amphiploidy in rice	Presidency College, Calcutta
12.	Appointment of a whole time Secretary for Rice Committee	I.C.A.R.
13.	Financial assistance to outstanding flower nurseries	I.C.A.R.
14.	Research on pests of citrus and their control, Aurangabad ..	Maharashtra
15.	Breeding papaya varieties resistant to leaf mosaic	Maharashtra
16.	Improvement of *ber* fruit	Madhya Pradesh
17.	Investigation on bunchy-top disease of banana	Kerala
18.	Ginger research, Wynad	Kerala
19.	Research on Kattee disease of cardamom	Kerala
20.	Research on cardamom	Kerala
21.	Improvement of chillies	West Bengal
22.	Improvement of chillies	Andhra Pradesh
23.	Establishment of a cardamom research station	Mysore
24.	Study of different control measures against hairy caterpillar pest of cardamom	Mysore

APPENDIX 2—Contd.

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
25.	Research on lemon grass	Kerala
26.	Research on cashewnut	Kerala
27.	Medicinal plants	Forest Research Institute
28.	Possibilities of using charcoal in improvement and reclamation of soils	Panjab University
29.	Investigation on the actinomycete population of paddy soils ..	Annamalai Univeristy
30.	Reclamation of saline and alkaline soils	Rajasthan
31.	Examining the behaviour of certain additional fertilizers under storage conditions	I.A.R.I.
32.	Investigation into the micro-nutrient status of soils	Maharashtra
33.	Study of the fertility index of soils and related phenomena leading to production equation of crop production	Field Research Station, Bombay
34.	Standardisation of methods for determining surface area and *p*H values of soils	Panjab University
35.	Soil structure studies of the Punjab soils	Punjab
36.	Placement of fertilizer for *kharif* jowar, groundnut, cotton, drilled paddy and wheat..	College of Agriculture, Dharwar
37.	Fodder research	West Bengal
38.	Improvement of root crops	West Bengal
39.	Research on tuber crops	Bihar
40.	Improvement of vegetables (Okra, egg-plant, cauliflower, tomato and carrot)	Punjab
41.	Improvement of vegetables	Punjab
42.	Research on miscellaneous tuber crops and related plants ..	Kerala University
43.	Physiological relationship between insect pests and their host plants	Delhi University
44.	Termite research	Forest Research Institute
45.	Research on toxicology and adverse effects of synthetic pesticides..	Madras
46.	Intensive studies on systematic biology and control of some of the insect pests—Mites	Punjab
47.	—do— —white flies	Andhra Pradesh
48.	Research on study of field rats..	Punjab
49.	Research on the study of field rats	Andhra Pradesh
50.	Research on the study of field rats	Maharashtra

APPENDIX 2—Contd.

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
51.	Research on the study of field rats	Uttar Pradesh
52.	Research on the study of field rats	Madras
53.	Exploration of toxicity hazards in the use of modern insecticides against cattle and human beings	I.V.R.I.
54.	Exploration of toxicity hazards in the use of modern insecticides against cattle and human beings	I.A.R.I.
55.	Fundamental research on toxicity and mode of action of insecticides	Panjab University
56.	Plant virus research, Eastern Zone, Kalimpong	I.A.R.I.
57.	Studies on the spore content of the atmosphere	Andhra University
58.	Investigation on cytogenetics and morphogenesis of nodules of some common Indian leguminous crops	Presidency College, Calcutta
59.	Coordination of agricultural research	I.C.A.R.
60.	Survey of additional indigenous agricultural implements in the various States	I.C.A.R.
61.	Cytogenetical studies in maize and *sorghum*	Andhra University
62.	Study of genetics and variability of algae	I.A.R.I.
63.	Investigation on drought resistance in wheat	Madhya Pradesh
64.	Preparation of vegetation maps of India	I.C.A.R.
65.	Deep-water paddy	Andhra Pradesh
66.	Rice in saline areas	Andhra Pradesh
67.	Salt and flood resistant strains of paddy	West Bengal
68.	Improvement of hill paddy	West Bengal
69.	Investigation into the method and practices of farming in various States..	I.C.A.R.
70	Preparation of a list of outstanding agricultural practices in India	I.C.A.R.
71.	Distress calls of birds	Maharashtra
72.	Research on Cashewnut	Maharashtra
	B. Animal Husbandry Schemes	
73.	Appointment of Liaison Officer (Sheep and Wool)	I.C.A.R.
74.	Expansion of central herd-book section	I.C.A.R.
75.	Definition of ideal animal	I.C.A.R.
76.	Regional Animal Nutrition Research Centre, Bangalore ..	N.D.R.I.

APPENDIX 2—Contd.

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
77.	Regional Animal Nutrition Research Centre, Anand ..	Institute of Agriculture, Anand
78.	Regional Animal Nutrition Research Centre, Haringhatta ..	West Bengal
79.	Improvement of sheep and wool on regional basis	Maharashtra
80.	Improvement of sheep and wool on regional basis	Madras
81.	Improvement of sheep and wool on regional basis	Rajasthan
82.	Skin studies of sheep to evaluate the quality of wool	Maharashtra
83.	Research in developing mutton breeds of sheep	Andhra Pradesh
84.	Establishment of wool utilisation centre	Madras
85.	Development of Angora Goats for meat and mohair production ..	Maharashtra
86.	Formation of hybrids from early tested inbreds of White Leghorn	Allahabad Agricultural Institute
87.	Investigating advantages of broiler production in large units ..	Andhra Pradesh
88.	Spreading out breeding season in buffaloes	I.V.R.I.
89.	Methods of detecting adulteration and estimating major constituents of milk	Panjab University
90.	Standardisation of an accelerated oxidation test to determine shelf life of ghee	N.D.R.I.
91.	Bovine contagious pleuro-pneumonia	Assam
92.	Investigation of bovine para-plegia and Paralysis	Mysore
93.	Appointment of disease investigation officer	Himachal Pradesh
94.	Control of filariasis in cattle	Bihar
95.	Biological control of fascioliasis by introduction of ducks at Bansawada	Andhra Pradesh
96.	Investigation into diseases of pigs	Andhra Pradesh
97.	Control and eradication of humpsore	Orissa
98.	Control and eradication of humpsore	Assam
99.	Control and eradication of humpsore	West Bengal
100.	Control of brucellosis	Bihar
101.	Control of brucellosis	Madras
102.	Paddy-cum-Pisciculture	Andhra Pradesh
103.	Yak survey	I.C.A.R.
104.	Selective breeding and grading up of local cattle	West Bengal

APPENDIX 2—Concluded

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
105.	Comparative study of grading up *Vs.* cross breeding ..	Himachal Pradesh
	C. Other Schemes	
106.	Study of cultivation practices and yield of fruit crops .. .. (i) Guava in Allahabad (U.P.) (ii) Banana in Kerala	I.C.A.R.
107.	Pilot scheme for maintaining research project files	I.C.A.R.
108.	Publication of the Indian Journal of Veterinary Education ..	I.C.A.R.
109.	Publication of ' Indian Potato Journal '	I.C.A.R.
110.	Supply of Agricultural Information literature to National Extension Service/Community Development Blocks	I.C.A.R.
111.	Publication of books in Hindi and regional languages ..	I.C.A.R.
112.	Sale arrangements of monographs issued by the Commodity Committees	I.C.A.R.
113.	Study of advantages and economics of mechanical farming ..	Madras

APPENDIX 3

Additional Grants for Schemes

Sl. No.	Name of the Scheme	Sponsoring/Government Authority
	A. Agricultural Schemes	
1.	Fundamental studies in embryo and organ culture	Presidency College, Calcutta
2.	Interspecific and intergeneric hybridisation of Indian wheat ..	Maharashtra Association for the Cultivation of Science, Poona
3.	Research on Pulses	Orissa
4.	Investigation of helminthosporiose disease of paddy	Madras
5.	Cytogenetical investigation on annona, guava and pomegranate, Coimbatore	Madras
6.	Co-ordinated scheme for research on floriculture	I.C.A.R.
7.	Award of prizes to outstanding contributors to the promotion of Agriculture and Horticulture..	I.C.A.R.
8.	Investigation of the diseases of banana	Madras
9.	Cultivation of medicinal plants	Regional Research Laboratory, Jammu Tawi
10.	Cultivation of medicinal plants	Madras
11.	Role of exchangeable basis and humus in plant nutrition ..	Field Research Station, Bombay
12.	Research on onion, Anantharajupet	Andhra Pradesh
13.	Co-ordinated scheme for the trial of improved and imported agricultural implements in various States	I.C.A.R.
	B. Animal Husbandry Schemes	
14.	Improvement of sheep and wool	Rajasthan
15.	Producing poultry in larger units, Nagpur	I.C.A.R.
16.	Broiler production in larger units, Hyderabad	I.C.A.R.
17.	Tuberculin testing of cattle in Madras	I.C.A.R.
18.	Comparative study of efficiency of cows and buffaloes in milk production at different levels	Institute of Agriculture, Anand
19.	Regional Animal Nutrition Research Centre, Bangalore ..	I.C.A.R.
	C. Other Schemes	
20.	Sample survey to determine effects of mechanisation of fishing crafts	Maharashtra
21.	Study of economics of bunding	Maharashtra
22.	Integrated statistical scheme	I.C.A.R.
23.	Editors' scheme	I.C.A.R.

APPENDIX 4

List of Schemes Terminated

1. Deep water paddy, Mysore
2. Breeding paddy for lift irrigation, Andhra Pradesh
3. Stem-rot diseases of rice, Madras
4. Breeding salt- and flood-resistant varieties of paddy, West Bengal
5. Paddy breeding, West Bengal
6. Hybrid maize, Mysore
7. Fodder production, Mysore
8. Draught resistance in wheat, Madhya Pradesh
9. Horticulture, Orissa
10. Date-palm, Kutch
11. Fruit preservation, Annamalai University
12. Evolution of new varieties of mango, grapes and citrus, Punjab
13. Physiological studies on factors governing root formation in cutting and layering of fruit trees, Calcutta University
14. Musk-melon and water-melon, I.A.R.I.
15. Spices, Delhi University, Delhi
16. Establishment of research station for pepper, Kerala
17. Establishment of research station for cardamom, Mysore
18. Phosphatic reversions in the Nilgiris, Madras
19. Foliar application of nutrient crops, I.A.R.I.
20. Salinity research scheme, B. R. College, Agra
21. Biological nitrogen fixation, Andhra Pradesh
22. Biological control of aphids under Dr. A. S. Srivastava, Government Entomologist, Uttar Pradesh
23. Fundamental research on toxicity and mode of action of insecticides, Panjab University College, Hoshiarpur
24. Termite research, F.R.I.
25. Nutritional and biological studies on insects, I.A.R.I.
26. Research on toxicity and adverse effect of synthetic pesticides, Madras
27. Cultivation of camphor in Wynad, Kerala
28. Storage trials on fertilisers, I.A.R.I.
29. Pilot sample investigation on the cultivation practices and yield of mango crops, Maharashtra
30. Pilot survey to work out the cost of production of sheep and wool, Rajasthan

31. Pilot survey to work out the cost of production of sheep and wool, Andhra Pradesh
32. Enquiry into factors influencing cropping pattern on individual holdings, B.R. College, Agra
33. Enquiry into factors influencing cropping pattern on individual holdings, Bhubaneswar, Orissa
34. Study of production and consumption aspects of agricultural families in different class structures, Gujarat
35. Investigation on the adoption of improved practices and the capital invested on different types and sizes of farms, Dharwar, Mysore
36. Studies in the behaviour of consumption and marketing practices, Gokhale Institute of Politics and Economics
37. Conducting pilot survey for evaluation of various improved agricultural practices, Uttar Pradesh
38. Poultry development, American Mission, Madras
39. Rearing of White Leghorn Chickens, Y.M.C.A., Madras
40. Cheap poultry houses, Madras
41. Cheap poultry houses, Bihar
42. Cheap poultry houses, Orissa
43. Cheap poultry houses, Uttar Pradesh
44. Study of cross-breeding in poultry, Allahabad Agricultural Institute, Allahabad
45. Keeping poultry in batteries, West Bengal
46. Formation of hybrids from early tested inbreds of White Leghorn and Rhode Island Red, Allahabad Agricultural Institute, Allahabad
47. Physiology of hump, dewlap and sheath etc., West Bengal
48. Indigenous cattle (Ghumsur), Orissa
49. Physiological genetics of cattle, West Bengal
50. Feed requirements of sheep in range and agricultural conditions, I.V.R.I.
51. Nutritional requirements of pigs, I.V.R.I.
52. Systematic supply of poultry rations, Punjab
53. Estimation of major constituents of milk, Panjab University
54. Accelerated oxidation test, N.D.R.I.
55. Milk sucked by calves, Anand
56. Dairy utensils, Allahabad Agricultural Institute, Allahabad
57. Angora goat breeding, Uttar Pradesh
58. A. D. I. O. (pigs), Punjab
59. Rabies Research and Diagnostic Centre, I.V.R.I.
60. Fluke diseases of bovines, Mysore
61. Bacteriological flora of bovine genetalia and retention of placenta, Orissa
62. Brackish water fish culture, Madras

APPENDIX 5

STATEMENT SHOWING THE GRANTS RECEIVED FROM THE GOVERNMENT OF INDIA

		Rs.
1.	Weed control scheme—1961-62	5,300·00
2.	Co-ordinated scheme on dairy farming	12,700·00
3.	Co-ordinated maize breeding scheme	6,40,000·00
4.	Project for intensification of regional research on cotton, oilseeds and millets	12,37,000·00
5.	Establishment of regional animal nutrition centres	2,01,359·00
6.	Production of agricultural films	2,00,000·00
7.	Co-ordinated scheme for improvement of sheep and wool on regional basis	2,25,000·00
8.	Co-ordinated cattle sterility scheme	10,000·00
9.	Pilot survey for study of cultivation practices of pepper	11,845·00
10.	Wheat-rust control scheme	6,200·00
11.	Selective breeding and grading up of cattle during 1961-62	1,00,000·00
12.	Cross breeding of cattle 1961-62	1,60,000·00
13.	Comparative value of grading up with Sindhi and cross breeding of other Jersey bulls for increased milk production	45,000·00
14.	Artificial Insemination Centre, Bangalore	72,000·00
15.	National Index of Field Experiment	90,000·00
16.	Camel Breeding Scheme, Rajasthan	52,200·00
17.	Research and development of pepper and cashewnuts—1961-62	46,400·00
18.	Intensive Distt. Agricultural Programme	27,300·00
19.	Additional facilities at the Institute of I.A.R.S.	21,000·00
20.	Scheme for the study of milk yield, breeds and management practices of bovine	1,00,000·00
21.	Pilot scheme for study of feeding and rearing practices of sheep and yield of wool	1,66,000·00
22.	Pilot investigation for collection of statistical data on yield and extent of cashew-nut cultivation and practice adopted in its cultivation	40,800·00
23.	Study and incidence of pests and diseases on rice	59,400·00
24.	Manurial and agronomic trials	73,000·00
25.	National Horotorium	2,14,700·00
26.	Cost of milk production	1,13,200·00

APPENDIX 5—Concluded

		Rs.
27.	Study of poultry practice and production	70,000·00
28.	Pilot investigation for collection of statistical data on yield and extent of cardamom cultivation and practices adopted in its cultivation	90,000·00
29.	Survey of fertilizer and manuring practices	21,500·00
	Total ..	41,11,904·00

APPENDIX 6

STATEMENT SHOWING THE GRANTS RECEIVED FROM SOURCES OTHER THAN THE GOVERNMENT OF INDIA

		Rs.
1.	Indian Central Jute Committee, Calcutta	2,000·00
2.	Indian Central Oilseeds Committee, Hyderabad	23,710·00
3.	Indian Central Cotton Committee	2,000·00
4.	Grant received under T.C.M. programme in shape of implements, etc. ..	6,207·38
5.	Production of agricultural films (Film Pool)	30,000·00
	Total ..	63,917·38

APPENDIX 7

Meetings of the Various Bodies of the Indian Council of Agricultural Research

Sl. No.	Name of the Body	No. of meetings
1.	Agricultural and Animal Husbandry Regional Committees	8
2.	Scientific Committees	42
3.	Rice Committee and its Sub-Committees and Working Parties	15
4.	Other Committees and Sub-Committees	3
5.	Working Party on Agriculture	1
6.	Working Party on Animal Husbandry	1
7.	Board of Research	1
8.	Advisory Board	1
9.	Standing Finance Committee	1
10.	Governing Body	1
11.	Annual General Meeting	1
12.	Special General Meeting	1
13.	Horticulture Development Board	1

APPENDIX 8

Conferences, Seminars and Shows held

Sl. No.	Name of the Conference/Seminar/Show	Venue
1.	Fourth Horticultural Research Workers' Conference	Poona
2.	All India Mango Show (Juicy varieties)	Indore
3.	All India Citrus Show	New Delhi
4.	Conference of Horticultural Development Officers	Bangalore
5.	Seminar on weed Control	Aarey Milk Colony, Bombay
6.	Seminar on Dry Farming	
7.	Seminar on Green Manuring	
8.	Seminar on Irrigation, Drainage and Water-logging Problems	
9.	Seminar on Design, Development and Testing of Improved Agricultural Implements	Aarey Milk Colony, Bombay
10.	Maize Conference	New Delhi
11.	First Conference of Poultry Research Workers in India ..	Hyderabad
12.	Conference on Parasites and Parasitic Diseases	Madras
13.	Tenth Animal Diseases Conference	I.V.R.I., Izatnagar

APPENDIX 9

List of Members of the Indian Council of Agricultural Research

1. Shri S. K. Patil,
   Minister of Food and Agriculture,
   Government of India, New Delhi.

2. Dr. P. S. Deshmukh,
   Minister of Agriculture,
   Government of India, New Delhi.

3. Shri G. R. Kamat,
   Special Secretary to the Government of India, Ministry of Food and Agriculture (Department of Agriculture), and Vice-President, Indian Council of Agricultural Research, New Delhi.

4. Shri A. Balarami Reddy,
   Minister in charge of Agriculture,
   Government of Andhra Pradesh,
   Hyderabad.

5. Shri Moinul Haque Choudhury,
   Minister in charge of Agriculture,
   Veterinary and Livetsock,
   Government of Assam, Shillong.

6. Shri Bir Chand Patel,
   Minister in charge of Agriculture,
   Government of Bihar, Patna.

7. Shri Ustavbhai S. Parikh,
   Minister in charge of Agriculture,
   Animal Husbandry and Veterinary,
   Government of Gujarat, Ahmedabad.

8. Shri E. P. Paulose,
   Minister in charge of Agriculture,
   Animal Husbandry and Veterinary,
   Government of Kerala, Trivandrum.

9. Shri V. V. Dravid,
   Minister in charge of Agriculture,
   Animal Husbandry,
   Government of Madhya Pradesh, Bhopal.

10. Shri P. Kakkan,
    Minister in charge of Agriculture,
    Animal Husbandry and Veterinary,
    Government of Madras, 'Greenways',
    Greenways Road, Madras-28.

11. Shri D. V. Desai,
    Minister in charge of Agriculture,
    Animal Husbandry and Veterinary,
    Government of Maharashtra, Sachivalaya,
    Bombay.

12. Shri B. Rachiah,
    Minister in charge of Agriculture,
    Animal Husbandry and Veterinary,
    Government of Mysore, Vidhan Soudha,
    Bangalore.

13. Shri Pabitra Mohan Pradhan,
    Minister in charge of Agriculture,
    Government of Orissa, Bhubaneswar.

14. Master Gurbanta Singh,
    Minister in charge of Agriculture,
    Government of Punjab, Chandigarh.

15. Shri Nathu Ram Mirdha,
    Minister in charge of Agriculture and Animal Husbandry,
    Government of Rajasthan, Jaipur.

16. Shri Charan Singh,
    Minister in charge of Agriculture,
    Animal Husbandry and Veterinary,
    Government of Uttar Pradesh, Lucknow.

17. Shri Prafulla Chandra Sen,
    Minister in charge of Agriculture,
    Government of West Bengal, Calcutta.

18. Shri M. Assad-Ullah Mir,
    Minister in charge of Agriculture,
    Animal Husbandry and Veterinary,
    Government of Jammu and Kashmir,
    Srinagar/Jammu Tawi.

19. Shri M. Pallam Raju,
    Minister in charge of Animal Husbandry,
    Government of Andhra Pradesh, Hyderabad.

20. Shri H. N. Mishra,
    Minister in charge of Animal Husbandry and Veterinary,
    Government of Bihar, Patna.

21. Shri M. V. Krishnappa,
    Minister in charge of Animal Husbandry and Veterinary,
    Government of Mysore, Vidhan Soudha,
    Bangalore.

22. Shri P. V. Jaganath Rao,
    Minister in charge of Animal Husbandry,
    Government of Orissa, Bhubaneswar.

23. Giani Zail Singh,
    Minister in charge of Animal Husbandry,
    Government of Punjab, Chandigarh.

24. Shri S. M. Fazlur Rahman,
    Minister in charge of Animal Husbandry,
    Government of West Bengal, Writers' Buildings, Calcutta-1.

25. Shri Bhagwan Sahay,
    Chief Commissioner of Delhi,
    No. 6, Ludlow Castle Road, Delhi.

26. Raja Bajrang Bahadur Singh of Bhadri,
    Lt. Governor of Himachal Pradesh, Simla-4.

APPENDIX 9—Contd.

27. Shri N. M. Patnaik,
Chief Commissioner of Tripura, Agartala.

28. Shri J. M. Raina,
Chief Commissioner of Manipur, Imphal.

29. Shri B. N. Maheshwari,
Chief Commissioner of Andaman and Nicobar Islands, Port Blair.

30. Shri N. Ramunnu,
Administrator, Laccadive, Minicoy and Amindivi Islands, Kozhikode-4.

31. Shri D. Vishwanatha Reddy,
Director of Agriculture,
Andhra Pradesh, Hyderabad Dn-4.

32. Dr. S. R. Barooah,
Director of Agriculture,
Assam, Shillong.

33. Shri B. P. Akhaury,
Director of Agriculture,
Bihar, Patna.

34. Dr. G. A. Patel,
Director of Agriculture,
Gujarat, Ahmedabad.

35. Shri L. S. S. Kumar,
Director of Agriculture,
Kerala, Trivandrum.

36. Dr. Mohd. Akbar,
Director of Agriculture,
Madhya Pradesh, Rewa.

37. Shri V. Karthikeyan,
Director of Agriculture,
Madras, PB. No. 412, Triplicane,
Madras-6.

38. Dr. M. B. Ghatge,
Director of Agriculture,
Maharashtra, Bombay.

39. Shri M. Mallaraj Urs,
Director of Agriculture,
Mysore, Bangalore-1.

40. Shri S. M. Patnaik,
Director of Agriculture and Food Production,
Orissa, Bhubaneswar.

41. Shri Pritam Singh Diol,
Director of Agriculture,
Punjab, Chandigarh.

42. Shri Samrath Raj,
Director of Agriculture,
Rajasthan, Jaipur.

43. Shri R. R. Aggarwal,
Director of Agriculture,
Uttar Pradesh, Lucknow.

44. Dr. H. K. Nandi,
Director of Agriculture,
West Bengal, Writers' Building, Calcutta.

45. Shri G. M. Butt,
Director of Agriculture,
Jammu and Kashmir,
Jammu Tawi/Srinagar.

46. Dr. P. M. N. Naidu,
Director of Animal Husbandry and Fisheries,
Andhra Pradesh, Hyderabad-Dn.

47. Shri G. K. Mehra,
Director of Veterinary Department,
Assam, Gauhati.

48. Shri S. K. Sen,
Director of Animal Husbandry,
Bihar, Patna.

49. Dr. M. N. Menon,
Director of Animal Husbandry,
Kerala, P.B. No. 57, Trivandrum-1.

50. Shri G. C. Juneja,
Director of Veterinary and Animal Husbandry Services,
Madhya Pradesh, Jahangirabad, Bhopal.

51. Shri D. Pattabiraman,
Director of Animal Husbandry,
15, Marshall's Road, Egmore, Madras-8.

52. Shri S. B. Kazi,
Director of Animal Husbandry,
Maharashtra, Poona.

53. Dr. K. S. Shetty,
Director of Animal Husbandry and Veterinary Services,
Mysore, Bangalore.

54. Shri G. Biswal,
Director of Animal Husbandry and Veterinary Services,
Orissa, Cuttack.

55. Shri P. S. Brar,
Director of Animal Husbandry,
Punjab, Chandigarh.

56. Shri G. S. Rathore,
Director of Animal Husbandry,
Rajasthan, Jaipur.

57. Shri M. R. Mahajan,
Director of Animal Husbandry,
Uttar Pradesh, Lucknow.

APPENDIX 9—Contd.

58. Dr. K. C. Mukherjee,
Director of Veterinary Services,
West Bengal, New Secretariat Building,
Calcutta.

59. Shri Ghulam Mohy-ud-Din,
Director of Veterinary Services,
Jammu and Kashmir, Jammu Tawi/Srinagar.

60. Shri K. R. Damle,
Secretary to the Government of India,
Ministry of Food and Agriculture (Department of Agriculture), New Delhi.

61. Shri S. Channa Reddy,
Member, Rajya Sabha,
3-4-872/1, Barkatpura, (Opposite Andhra Yuvati Mandli), Hyderabad Dn./74, North Avenue, New Delhi.

62. Shri Dahayabhai Vallabhbhai Patel,
Member, Rajya Sabha,
Floor No. IV, Room No. 9, Netaji Subhas Road, M.H. No. 115, Bombay/21, Western Court, New Delhi.

63. Shri M. Shankaraiya,
Member, Lok Sabha,
111, Main Road, Vani Vilas Mohalla, Mysore City/14-D, Ferozeshah Road, New Delhi.

64. Sardar Iqbal Singh,
Member, Lok Sabha,
House No. 662, Ward No. 6, Abohar, Punjab.

65. Shri P. R. Patel,
Member, Lok Sabha,
Pilaji Ganj, Mehsana, Gujarat.

66. Shri Mohan Nayak,
Thakkar Bappa Ashram, P.O. Nimakhandi,
District Ganjam, Orissa.

67. Shri G. V. Swaika,
P.N.B. House, 18-B Brabourne Road,
Calcutta-1.

68. Sri A. R. Foster,
Managing Director,
Imperial Chemical Industries (India) Ltd.,
Hamilton House, New Delhi.

69. Dr. J. S. Patel,
Agricultural Commissioner with the Government of India, New Delhi.

70. Shri L. Sahai,
Animal Husbandry Commissioner with the Government of India, New Delhi.

71. Dr. S. M. Sikka,
Additional Agricultural Commissioner with the Government of India, New Delhi.

72. Dr. R. N. Mathur,
Additional Agricultural Commissioner with the Government of India, New Delhi.

73. Shri N. P. Chatterjee,
Agricultural Marketing Adviser to the Government of India, Nagpur.

74. Dr. B. P. Pal,
Director, Indian Agricultural Research Institute, New Delhi.

75. Dr. H. D. Srivastava,
Director, Indian Veterinary Research Institute, Izatnagar.

76. Dr. S. Bhagvantam,
Director, Indian Institute of Science,
Bangalore.

77. Dr. R. H. Richharia,
Director, Central Rice Research Institute,
Cuttack.

78. Dr. Pushkar Nath,
Director, Central Potato Research Institute,
Simla.

79. Shri K. P. Sagreiya,
President, Forest Research Institute and Colleges, P.O. New Forest, Dehra Dun.

80. Dr. M. D. Patel,
Director, Institute of Agriculture, Anand.

81. Dr. K. K. Iya,
Director of Dairy Research, National Dairy Research Institute, Karnal.

82. Shri T. S. Krishnamurthi,
Secretary, Central Board of Forestry,
Ministry of Food and Agriculture (Department of Agriculture), New Delhi.

83. Prof. M. S. Thacker,
Director General, Council of Scientific and Industrial Research, New Delhi.

84. Shrimati Lilavati Munshi,
President, All India Womens' Central Food Council, Bhartiya Vidya Bhavan, Chowpatty Road, Bombay-7.

85. Shri R. C. Sen,
Inspector-General of Forests,
Ministry of Food and Agriculture (Department of Agriculture), New Delhi.

86. Shri Tribhuwandas K. Patel,
Chairman, Kaira District Co-operative Milk Producers' Union Ltd., Anand.

87. Dr. C. G. Pandit,
Director, Indian Council of Medical Research, Medical Enclave, New Delhi.

APPENDIX 9—Contd.

88. Dr. A. C. Joshi,
Vice-Chancellor, Panjab University,
Chandigarh.

89. Shri Babubhai J. Patel,
Vice-Chancellor, Sardar Vallabhbhai
Vidyapeth, Vallabh Vidyanagar, Gujarat.

90. Dr. P. Parija,
Vice-Chancellor, Utkal University,
Cuttack-1.

91. Dr. A. L. Narayana,
Vice-Chancellor, Andhra University,
Waltair.

92. Shri S. Ananda Rau,
Chief Scientific Officer, United Planters'
Association of Southern India, 'Glenview',
Coonoor, Nilgiris.

93. Shri U. K. Lakshman Gowda,
Urvinkhan Estate, Javali, P.O., Chika-
magalur Distt., Mysore.

94. Shri A. K. Rajapadmanabhan,
Deputy Rubber Production Commissioner,
Rubber Board, Kottayam, Kerala.

95. Director of Military Farms,
Directorate of Military Farms,
Army Headquarters, New Delhi.

96. Dr. B. L. Sethi,
Secretary, Indian Central Cotton Committee,
14, Nicol Road, Ballard Estate,
Bombay-1.

97. Shri S. C. Mukherjee,
4-A, Bowbazar Orphanage Lane,
P.O. Bowbazar, Calcutta.

98. Shri Gandarpanath Shah Deo,
Lake Road, Ranchi.

99. Dr. T. S. Venkataraman,
56, Thayagaraja Road, Thayagaraja Nagar,
Madras-17.

100. Shri P. Bala Rama Kurup,
P.O. Box. No. 74, Kozhikode, (Calicut).

101. Shri Mohanlal Ambalal Parikh,
C/o M/s. Mohanlal Hargovindas & Co.,
51, Dady Seth Agiary Lane, Bombay-2.

102. Shri G. U. Rao,
54, Kandappa Chetty Street, Madras-1/
ICS Road, P.O. Nellore District, Andhra
Pradesh.

103. Shri A. Bhima Bhat,
Advocate, Puttur, South Kanara,
Mangalore.

104. Shri Madan Mohan R. Ruia,
Vice-President, Indian Central Cotton
Committee, C/o. M/s. Ram Narain and Sons
Private Ltd., State Bank Building, Annexe,
Bank Street, Fort, Bombay.

105. Shri B. P. Kedia,
Vice-President, Indian Central Jute Com-
mittee, C/o Messrs Anderson Wright Ltd.,
Wellesley Place, Calcutta.

106. Dr. R. Nagan Gowda, M.L.A.,
Vice-President, Indian Central Sugarcane
Committee, Hospet, District Bellary,
Mysore.

107. Shri K. P. Madhavan Nair,
Member Rajya Sabha and Vice-President,
Indian Central Coconut Committee,
Ernakulam Mills, Ernakulam/26, Queen
Victoria Road, New Delhi.

108. Shri T. Kenetappiah,
Advocate, and Vice-President, Indian Central
Tobacco Committee, Station Road, Kotha-
gudiam, P.O., Khamman District, Andhra
Pradesh.

109. Shri Ratilal M. Gandhi,
Vice-President, Indian Central Oilseeds
Committee, C/o Ratial and Co., Curreemjee
Building, 111, Mahatma Gandhi Road,
Bombay.

110. Shri C. M. John,
Vice-President, Indian Central Arecanut
Committee, Charukara Farms, Changana-
cherry, Kottayam District, Kerala.

111. Shri S. C. Choudhri,
Economic and Statistical Adviser,
Ministry of Food and Agriculture (Depart-
ment of Agriculture), Government of India,
New Delhi.

112. Dr V. G. Panse,
Statistical Adviser, Indian Council of
Agricultural Research, New Delhi.

113. Dr. N. K. Panikkar,
Fisheries Development Adviser to the
Government of India, Ministry of Food and
Agriculture, (Department of Agriculture),
New Delhi.

114. Shri A. C. Bose,
Joint-Secretary to the Government of India,
Ministry of Finance (Department of Expendi-
ture) and Financial Adviser to the Indian
Council of Agricultural Research, New
Delhi.

115. Shri G. S. Dhillon,
Dhillon's Farm, Shivpuri, Madhya Pradesh.

APPENDIX 9—Concluded

116. Shri Vijendra Narain Kak,
Vasundhara, Jaipur.

117. Shri V. C. Palaniswamy Gounder,
Vellakinar, P.O. Coimbatore.

118. Sardar Kartar Singh Dewana, M.L.A.,
village and P.O. Amargarh, Tehsil Malerkotla, Punjab.

119. Shri Thakur Das Bhargava,
Advocate, Member Lok Sabha,
Anand Bhavan, Hissar/31, Canning Lane,
New Delhi.

120. Shri M. P. Gandhi,
C/o Gandhi & Co., Nannabhoy Mansion,
Sir Pherozeshah Mehta Road, Fort, Bombay.

121. Sardar Satwant Singh,
Nasirpur Farm, P.O. Bahadurgarh Fort,
Patiala.

122. Shri P. R. Kanawade Patil,
Advocate, Rangar Galli, Ahmednagar,
Maharashtra.

123. Shri B. Prasad,
Dewan of Sikkim, Gangtok.

124. Dr. K. L. Narsimham,
Director of Agriculture and Animal Husbandry,
Sikkim, Gangtok.

APPENDIX 10

List of Members of the Governing Body

1. Shri S. K. Patil,
Minister of Food and Agriculture,
Government of India, New Delhi.
(President).

2. Dr. P. S. Deshmukh,
Minister of Agriculture,
Government of India, New Delhi.

3. Shri G. R. Kamat,
Special Secretary to the Government of India,
Ministry of Food and Agriculture (Department of Agriculture) and Vice-President,
Indian Council of Agricultural Research,
New Delhi.

4. Shri A. Balarami Reddy,
Minister in charge of Agriculture,
Government of Andhra Pradesh,
Hyderabad.

5. Shri Moinul Haque Choudhury,
Minister in charge of Agriculture,
Veterinary and Livestock, Government of Assam, Shillong.

6. Shri Bir Chand Patel,
Minister in charge of Agriculture,
Government of Bihar, Patna.

7. Shri Utsavbhai S. Parikh,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary, Government of Gujarat, Ahmedabad.

8. Shri E. P. Paulose,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary Services,
Government of Kerala, Trivandrum.

9. Shri V. V. Dravid,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary,
Government of Madhya Pradesh, Bhopal.

10. Shri P. Kakkan,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary,
Government of Madras, 'Greenways',
Greenways Road, Madras-28.

11. Shri D. V. Desai,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary Services,
Government of Maharashtra, Sachivalaya,
Bombay.

12. Shri B. Raghiah,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary Services,
Government of Mysore, Vidhan Soudha,
Bangalore.

13. Shri Pabitra Mohan Pradhan,
Minister in charge of Agriculture,
Government of Orissa, Bhubaneswar.

14. Master Gurbanta Singh,
Minister in charge of Agriculture,
Government of Punjab, Chandigarh.

15. Shri Nathu Ram Mirdha,
Minister in charge of Agriculture and Animal Husbandry,
Government of Rajasthan, Jaipur.

16. Shri Charan Singh,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary,
Government of Uttar Pradesh, Lucknow.

17. Shri Prafulla Chandra Sen,
Minister in charge of Agriculture,
Government of West Bengal, Calcutta.

18. Shri M. Assad-Ullah Mir,
Minister in charge of Agriculture,
Animal Husbandry and Veterinary,
Government of Jammu and Kashmir,
Srinagar/Jammu Tawi.

19. Shri M. Pallam Raju,
Minister in charge of Animal Husbandry,
Government of Andhra Pradesh,
Hyderabad.

20. Shri H. N. Mishra,
Minister in charge of Animal Husbandry and Veterinary,
Government of Bihar, Patna.

21. Shri M. V. Krishnappa,
Minister in charge of Animal Husbandry and Veterinary,
Government of Mysore, Vidhan Soudha,
Bangalore.

22. Shri Jaganath Rao,
Minister in charge of Animal Husbandry,
Government of Orissa, Bhubaneswar.

23. Giani Zail Singh,
Minister in charge of Animal Husbandry,
Government of Punjab, Chandigarh.

24. Shri S. M. Fazlur Rahman,
Minister in charge of Animal Husbandry and Veterinary Services,
Government of West Bengal, Calcutta-1.

25. Shri K. R. Damle,
Secretary to the Government of India,
Ministry of Food and Agriculture (Department of Agriculture), New Delhi.

APPENDIX 10—Concluded

26. Shri Bhagwan Sahay,
Chief Commissioner of Delhi,
No. 6, Ludlow Castle Road, Delhi.

27. Raja Bajrang Bahadur Singh of Bhadri,
Lt. Governor of Himachal Pradesh,
Simla-4.

28. Shri N. M. Patnaik,
Chief Commissioner of Tripura,
Agartala.

29. Shri J. M. N. Raina,
Chief Commissioner of Manipur,
Imphal.

30. Shri B. N. Maheshwari,
Chief Commissioner of Andaman and Nicobar Islands, Port Blair.

31. Shri N. Ramunny,
Administrator,
Laccadive, Minicoy and Amindivi Islands,
Kozhikode-4.

32. Shri S. Channa Reddy,
Member, Rajya Sabha,
3-4-/872/1, Barkatpura, (Opposite Andhra Yuvati Mandli), Hyderabad-Dn.

33. Shri M. Shankaraiya,
Member, Lok Sabha,
111, Main Road, Vani Vilas Mohalla,
Mysore City.

34. Dr. R. Nagan Gowda, M. L. A.,
P.O. Hospet, Bellary, Mysore State.

35. Shri S. K. Sen,
Director of Animal Husbandry,
Bihar, Patna.

36. Shri A. C. Bose,
Joint-Secretary to the Government of India,
Ministry of Finance (Department of Expenditure), and Financial Adviser, Indian Council of Agricultural Research, New Delhi.

37. Shri Thakur Das Bhargava,
Advocate, Member, Lok Sabha,
Anand Bhavan, Hissar/31,
Canning Lane, New Delhi.

38. Shri M. P. Gandhi,
C/o Gandhi & Co., Nanabhoy Mansion,
Sir Pherozeshah Mehta Road, Fort,
Bombay.

39. Sardar Satwant Singh,
Nasirpur Farm, P.O. Bahadurgarh Fort,
Patiala.

40. Shri P. R. Kanawade Patil,
Advocate, Rangar Galli, Ahmednagar,
Maharashtra.

41. Shri B. Prasad,
Dewan of Sikkim, Gangtok.

APPENDIX 11

List of Members of the Standing Finance Committee

1. Shri K. R. Damle,
   Secretary to the Government of India,
   Ministry of Food and Agriculture (Department of Agriculture),
   New Delhi.

2. Shri G. R. Kamat,
   Special Secretary to the Government of India,
   Ministry of Food and Agriculture (Department of Agriculture) and Vice-President,
   Indian Council of Agricultural Research,
   New Delhi.

3. Shri A. C. Bose,
   Joint Secretary to the Government of India,
   Ministry of Finance (Department of Expenditure) and Financial Adviser,
   Indian Council of Agricultural Research,
   New Delhi.

4. Shri Satwant Singh,
   Nasirpur Farm, Bahadurgarh Fort,
   District Patiala, Punjab.

5. Dr. S. Krishnamurthi,
   Dean and Ex-officio Additional Director of Agriculture,
   Agricultural Research Institute and College,
   Coimbatore.

6. Shri C. V. G. Choudary,
   U.P. College of Veterinary Science and Animal Husbandry, Mathura.

7. Shri M. Shankaraiya.
   Member, Lokh Sabha,
   111, Main Road, Vani Vilas Mohalla,
   Mysore City/14-D,
   Ferozeshah Road, New Delhi.

APPENDIX 12

List of Members of the Advisory Board

1. Shri G. R. Kamat,
   Special Secretary to the Government of India, Ministry of Food and Agriculture (Department of Agriculture) and Vice-President, Indian Council of Agricultural Research, New Delhi.
2. Dr. J. S. Patel,
   Agricultural Commissioner with the Govenment of India, New Delhi.
3. Shri L. Sahai,
   Animal Husbandry Commissioner with the Government of India, New Delhi.
4. Dr. S. M. Sikka,
   Additional Agricultural Commissioner with the Government of India, New Delhi.
5. Dr. R. N. Mathur,
   Additional Agricultural Commissioner with the Government of India, New Delhi.
6. Shri Y. N. Verma,
   Extension Commissioner, Ministry of Food and Agriculture (Department of Agriculture), Government of India, New Delhi.
7. Shri N. P. Chatterjee,
   Agricultural Marketing Adviser to the Government of India, Nagpur.
8. Shri S. C. Choudhri,
   Economic and Statistical Adviser, Ministry of Food and Agriculture (Department of Agriculture), Government of India, New Delhi.
9. Dr. V. G. Panse,
   Statistical Adviser,
   Indian Council of Agricultural Research, Library Avenue, New Delhi.
10. Dr. B. P. Pal,
    Director,
    Indian Agricultural Research Institute, New Delhi.
11. Dr. H. D. Srivastava,
    Director,
    Indian Veterinary Research Institute, Izatnagar.
12. Dr. S. Bhagvantam,
    Director,
    Indian Institute of Science, Bangalore.
13. Dr. K. K. Iya,
    Director of Dairy Research,
    National Dairy Research Institute, Karnal.
14. Dr. R. H. Richharia,
    Director,
    Central Rice Research Institute, Cuttack.
15. Dr. Pushkar Nath,
    Director,
    Central Potato Reserarch Institute, Simla.
16. Shri D. Viswanatha Reddy,
    Director of Agriculture,
    Andhra Pradesh, Hyderabad-Dn.4.
17. Dr. S. R. Barooah,
    Director of Agriculture,
    Assam, Shillong.
18. Shri B. P. Akhaury,
    Director of Agriculture,
    Bihar, Patna.
19. Dr. G. A. Patel,
    Director of Agriculture and Animal Husbandry, Gujarat, Ahmedabad.
20. Shri L. S. S. Kumar,
    Director of Agriculture,
    Kerala, Trivandrum.
21. Dr. Mohd. Akbar,
    Director of Agriculture,
    Madhya Pradesh, Rewa.
22. Shri V. Karthikeyan,
    Director of Agriculture,
    Madras, P.B. No. 412, Triplicane, Madras-6.
23. Dr. M. B. Ghatge,
    Director of Agriculture,
    Maharashtra, Poona.
24. Shri M. Mallaraj Urs,
    Director of Agriculture, Mysore,
    Sheshadri Road, Bangalore-1.
25. Shri S. M. Patnaik,
    Director of Agriculture and Food Production,
    Orissa, Bhubaneswar.
26. Shri Pritam Singh Diol,
    Director of Agriculture, Punjab,
    Chandigarh.
27. Shri Samrath Raj,
    Director of Agriculture, Rajasthan, Jaipur.
28. Shri R. R. Aggarwal,
    Director of Agriculture, Uttar Pradesh,
    Lucknow.
29. Dr. H. K. Nandi,
    Director of Agriculture,
    West Bengal, Writers' Building, Calcutta.

APPENDIX 12—Contd.

30. Shri G. M. Butt,
Director of Agriculture,
Jammu and Kashmir, Jammu Tawi/Srinagar.

31. Dr. P. M. N. Naidu,
Director of Animal Husbandry and Fisheries,
Andhra Pradesh, Hyderabad- Dn.

32. Shri G. K. Mehra,
Director of Veterinary Department,
Assam, Gauhati.

33. Shri S. K. Sen,
Director of Animal Husbandry,
Bihar, Patna.

34. Dr. M. N. Menon,
Director of Animal Husbandry,
Kerala, P.B. No. 57, Trivandrum-1.

35. Shri G. C. Juneja,
Director of Veterinary and Animal Husbandry Services,
Madhya Pradesh, Jahangirabad, Bhopal.

36. Shri D. Pattabiraman,
Director of Animal Husbandry,
15, Marshall's Road, Egmore,
Madras-8.

37. Shri S. B. Kazi,
Director of Animal Husbandry,
Maharashtra, Poona.

38. Dr. K. S. Shetty,
Director of Animal Husbandry and Veterinary Services,
Mysore, Bangalore.

39. Shri G. Biswal,
Director of Animal Husbandry and Veterinary Services,
Orissa, Cuttack.

40. Shri P. S. Brar,
Director of Animal Husbandry,
Punjab, Chandigarh.

41. Shri G. S. Rathore,
Director of Animal Husbandry,
Rajasthan, Jaipur.

42. Shri M. R. Mahajan,
Director of Animal Husbandry,
Uttar Pradesh, Lucknow.

43. Dr. K. C. Mukherjee,
Director of Veterinary Services,
West Bengal, New Secretariat Building,
Calcutta.

44. Shri Ghulam Mohy-ud-Din,
Director of Veterinary Services,
Jammu and Kashmir, Jammu Tawi/Srinagar.

45. Shri K. P. Sagreiya,
President,
Forest Research Institute and Colleges,
P.O. New Forest, Dehra Dun.

46. Shri Tribhuwandas K. Patel,
Chairman,
Kaira District Co-operative Milk Producers' Union Ltd., Anand.

47. Dr. C. G. Pandit,
Director,
Indian Council of Medical Research,
Medical Enclave, New Delhi.

48. Dr. A. C. Joshi,
Vice-Chancellor,
Panjab University, Chandigarh.

49. Shri Babubhai J. Patel,
Vice-Chancellor,
Sardar Vallabhbhai Vidyapeeth,
Vallabh Vidyanagar, Gujarat.

50. Dr. P. Parija,
Vice-Chancellor,
Utkal University, Cuttack-1.

51. Dr. A. L. Narayana,
Vice-Chancellor,
Andhra University, Waltair.

52. Shri S. Ananda Rau,
Chief Scientific Officer,
United Planters' Association of Southern India, 'Glenview', Coonoor, Nilgiris.

53. Dr. B. L. Sethi,
Secretary,
Indian Central Cotton Committee,
14, Nicol Road, Ballard Estate, Bombay-1.

54. Shri S. C. Mukherjee,
4-A, Bowbazar, Orphanage Lane,
P.O. Bowbazar, Calcutta.

55. Shri Gandharpanath Shah Deo,
Lake Road, Ranchi.

56. Dr. T. S. Venkataraman,
56, Thayagaraja Road, Thayagaraja Nagar,
Madras-17.

57. Shri P. Balarama Kurup,
P.O. Box. No. 74, Kozhikode, (Calicut).

58. Shri Mohanlal Ambalal Parikh,
C/o M/s. Mohanlal Hargovindas & Co.,
51, Dady Seth Agiary Lane, Bombay-2.

59. Shri G. U. Rao,
54, Kandappa Chetty Street, Madras-1/
I.C.S. Road, P.O. Nellore District, Andhra Pradesh.

APPENDIX 12—Contd.

60. Shri A. Bhima Bhat,
Advocate,
Puttur, South Kanara, Mangalore.

61. Shri U. K. Lakshman Gowda,
Urvinkhan Estate, Javali, P.O.
Chikamagalur Distt., Mysore.

62. Shri A. K. Rajapadmanabhan,
Deputy Rubber Production Commissioner,
Rubber Board, Kottayam, Kerala.

63. Dr. N. K. Panikkar,
Fisheries Development Adviser to the Government of India,
Department of Agriculture,
New Delhi.

64. Shri R. R. Panje,
Director,
Indian Institute of Sugarcane Research,
Rai Bareilly Road, Dilkush, Lucknow.

65. Dr. J. Tuljaram Rao,
Director,
Sugarcane Breeding Institute,
Coimbatore.

66. Shri B. M. Lakshmipathy,
No. 13-G, Ormes Road,
Madras-10.

67. Dr. S. Krishnamurthi,
Dean and Additional Director of Agriculture,
Agricultural Research Institute and College,
Coimbatore-3.

68. Dr. B. Mukherji,
Director,
Central Drug Research Institute,
Chattar Manzil Palace, Lucknow.

69. Dr. T. S. Sadasivan,
Director,
University Botany Laboratory,
University of Madras,
Chepauk, Madras-5.

70. Dr. J. A. Daji,
384, Bhavani Peth, Madan Colony,
Poona-2.

71. Dr. M. L. Roonwal,
Director,
Zoological Survey of India,
34, Chittaranjan Avenue, Calcutta-1.

72. Dr. T. J. Mirchandani,
III-G-48, Lajpat Nagar, New Delhi-14.

73. Dr. V. R. Khanolkar,
Director,
Indian Cancer Research Centre,
Parel, Bombay-12.

74. Dr. D. N. Khurody,
Dairy Development Commissioner and Joint Secretary to the Government of Maharashtra,
Agriculture and Forests Department,
(Dairy Development Division), Old Secretariat Building, Fort, Bombay-1.

75. Shri S. S. Khot,
Liaison Officer,
(Sheep and Wool), Indian Council of Agricultural Research,
New Delhi.

76. Shri S. G. Iyer,
Poultry Specialist,
Directorate of Extension,
Ministry of Food and Agriculture (Department of Agriculture),
New Delhi.

77. Dr. N. D. Kehar,
Head of the Department of Animal Sciences,
U.P. Agricultural University, Pantnagar,
District Nainital.

78. Dr. P. S. Lokanathan,
Director General,
National Council of Applied Economic Research, Parisala Bhavan, 11, Indraprastha Estate, New Delhi-1.

79. Director of Military Farms,
Directorate of Military Farms, Army Headquarters, New Delhi.

80. Dr. K. T. Jacob,
Director,
Jute Agricultural Research Institute,
P.O. Nilganj Bazar, Barrackpore Distt.,
24-Parganas, West Bengal.

81. Dr. M. S. Muthana,
Director,
Indian Lac Research Institute,
Namkum, Ranchi.

82. Dr. R. Nagan Gowda, M.L.A.,
Mysore State, Bangalore.

83. Dr. K. P. V. Menon,
Director,
Central Coconut Research Station,
Kayangulam, Ochira, P.O. Kerala.

84. Dr. G. S. Murty,
Director,
Tobacco Research,
Central Tobacco Research Institute,
Rajahmundry.

85. Dr. M. S. Patel,
Secretary,
Indian Central Oilseeds Committee,
Hyderabad-1 (Andhra Pradesh).

APPENDIX 12—Concluded

86. Shri M. Mohan Rao,
Agronomist,
In-charge, Central Arecanut Research Station,
Vittal, South Kanara District Mysore.

87. Shri Ibne Ali,
Adviser (Agriculture),
Ministry of Community Development,
Panchayat Raj and Co-operation (Department of Community Development) and Panchayat Raj, New Delhi.

88. Shri R. N. Mohan,
Adviser (Animal Husbandry),
Ministry of Community Development
Panchayat Raj and Co-operation (Department of Community Development),
Government of India, New Delhi.

89. Shri Bishan Man Singh,
Civil Lines, Fatehpur, Uttar Pradesh.

90. Dr. P. Bhattacharya,
Livestock Development Adviser,
Ministry of Food and Agriculture (Department of Agriculture),
New Delhi.

91. Shri Nandkishore Narayan,
President,
Bihar Canegrowers' Federation,
Doomer Narendra, P.O. Bhore, District Saran, Bihar.

92. Dr. K. L. Narasimham,
Director of Agriculture and Animal Husbandry,
Sikkim, Gangtok.

93. Shri Jagjit Singh Mann,
Secretary,
Punjab Krishak Samaj,
137, Lal Bagh, Patiala.

APPENDIX 13

List of Members of the Board of Research

1. Shri G. R. Kamat,
Special Secretary, Ministry of Food and Agriculture (Department of Agriculture), and Vice-President, Indian Council of Agricultural Research, New Delhi.

2. Dr. J. S. Patel,
Agricultural Commissioner with the Government of India, New Delhi.

3. Shri L. Sahai,
Animal Husbandry Commissioner with the Government of India, New Delhi.

4. Dr. S. M. Sikka,
Additional Agricultural Commissioner with the Government of India, New Delhi.

5. Dr. R. N. Mathur,
Additional Agricultural Commissioner with the Government of India, New Delhi.

6. Shri Y. N. Verma,
Extension Commissioner, Ministry of Food and Agriculture (Department of Agriculture), New Delhi.

7. Dr. V. G. Panse,
Statistical Adviser, Indian Council of Agricultural Research, New Delhi.

8. Dr. B. P. Pal,
Director, Indian Agricultural Research Institute, New Delhi.

9. Dr. H. D. Srivastava,
Director, Indian Veterinary Research Institute, Izatnagar, (U.P.).

10. Dr. K. K. Iya,
Director, National Dairy Research Institute, Karnal.

11. Dr. R. H. Richharia,
Director, Central Rice Research Institute, Cuttack.

12. Dr. Pushkar Nath,
Director, Central Potato Research Institute, Simla.

13. Shri R. R. Panje,
Director, Indian Institute of Sugarcane Research, Rai Bareilly Road, Dilkush, Lucknow.

14. Dr. J. Tulja Ram Rao,
Director, Sugarcane Breeding Institute, Coimbatore-7.

15. Shri K. P. Segreiya,
President, Forest Research Institute and Colleges, P.O. New Forest, Dehra Dun.

16. Dr. V. R. Khanolkar,
Director, Indian Cancer Research Centre, Parel, Bombay-12.

17. Dr. T. S. Sadasivan,
Director, University Botany Laboratory, University of Madras, Chepauk, Madras-5.

18. Dr. M. L. Roonwal,
Director, Zoological Survey of India, 34, Chittaranjan Avenue, Calcutta-1.

19. Dr. B. Mukherji,
Director, Central Drug Research Institute, Chattar Manzil Palace, Lucknow.

20. Dr. S. Krishnamurthi,
Dean and Additional Director of Agriculture, Agricultural College and Research Institute, Coimbatore.

21. Dr. B. M. Lakshmipathy,
No. 3-13-G, Ormes Road, Madras-10.

22. Dr. T. J. Mirchandani,
III-G-48, Lajpat Nagar, New Delhi-14.

23. Dr. J. A. Daji,
384, Bhawani Peth, Madan Colony, Poona-2.

24. Shri D. N. Khurody,
Dairy Development Commissioner and Joint Secretary to the Government of Maharashtra, Agriculture and Forest Department (Dairy Development Division), Old Secretariat Buildings, Fort, Bombay-1.

25. Shri S. S. Khot,
Liaison Officer (Sheep and Wool), Indian Council of Agricultural Research, New Delhi.

26. Shri S. G. Iyer,
Poultry Specialist, Directorate of Extension, Ministry of Food and Agriculture (Department of Agriculture), Government of India, New Delhi.

27. Dr. N. D. Kehar,
Head of the Department of Animal Sciences, U.P. Agricultural University, Pantnagar, District Nainital.

28. Dr. N. K. Panikkar,
Fisheries Development Adviser to the Government of India, Ministry of Food and Agriculture (Department of Agriculture), New Delhi.

29. Dr. P. S. Lokanathan,
Director-General, National Council of Applied Economic Research, Parisila Bhavan, 11, Indra Prastha Estate, New Delhi.

APPENDIX 13—Concluded

30. Dr. B. L. Sethi,
Secretary, Indian Central Cotton Committee, 14, Nicol Road, Ballard Estate, P.B. No. 1002, Bombay-1.

31. Dr. K. T. Jacob,
Director, Jute Agricultural Research Institute, P.O. Nilganj Bazar, Barrackpore District, 24-Parganas, West Bengal.

32. Dr. M. S. Muthana,
Director, Indian Lac Research Institute, Namkum, Ranchi.

33. Dr. R. Nagan Gowda, M.L.A.,
Mysore State, Bangalore.

34. Dr. K. P. V. Menon,
Director, Central Coconut Research Station, Kayangulam, Ochira, P.O. Kerala.

35. Dr. G. S. Murty,
Director, Tobacco Research, Central Tobacco Research Institute, Rajahmundry, Andhra Pradesh.

36. Dr. M. S. Patel,
Secretary, Indian Central Oilseeds Committee,
Hyderabad-1 (Andhra Pradesh).

37. Shri M. Mohan Rao,
Officer-in-Charge, Central Arecanut Research Station, Vittal, South Kanara District, Mysore.

38. Shri Ibne Ali,
Adviser (Agriculture), Ministry of Community Development and Co-operation (Department of Community Development), Government of India,
New Delhi.

39. Shri R. N. Mohan,
Adviser (Animal Husbandry), Ministry of Community Development and Co-operation (Department of Community Development), Government of India,
New Delhi.

APPENDIX 14

List of Publications Issued

Books

1. Farmers of India Vol. II—Dr. M S. Randhawa, M. S. Sivaraman, I. J. Naidu and Suresh Vaidya
2. Handbook of Agriculture
3. Beautiful Trees and Gardens
4. Agricultural Education in India
5. Indian Dairy Year Book
6. Administrative Directory of I.C.A.R.
7. Bharat Men Pushpa Vriksh (Hindi)—Dr. M. S. Randhawa

Monographs

8. Crops and Weather—Dr. L. A. Ramdas
9. The Role of Blue Green Algae in Nitrogen Economy of Indian Agriculture—Dr. R. N. Singh
10. Biological Factors Affecting Hides and Skins in India—B. N. Soni
11. Grain Amaranth, Buck-wheat and Chenopods—H. B. Singh
12. Clavariaceae of India—K. S. Thind
13. Vauchariaceae—G. S. Venkataraman
14. Fruit Flies and their Control—E. S. Narayanan and H. N. Batra
15. Anatomy of Camel—James Daniel Grossman
16. Catalogue of Indian Insects—Part 29
17. Statistical Methods for Agricultural Workers—Dr. V. G. Panse and Dr. P. V. Sukhatme

Reports and Proceedings of Symposia

18. Second Report of Model Agronomic Experiments
19. Cost of Milk Production
20. Composition of Milk and Ghee
21. Market Quality of Ghee
22. Annual Report of I.C.A.R. 1959-60
23. Annual Report of I.C.A.R. 1960-61
24. Proceedings of the Symposium on Radio-isotopes, Fertilizers and Cowdung and Gas Plant
25. Annual Report of I.C.A.R. 1960-61 (Hindi)

Bulletins

26. A Study of Shifting Cultivation of Assam
27. Land Transformation

APPENDIX 14—Concluded

28. Ranikhet Disease in Poultry
29. Foot-and-Mouth Disease in India
30. Properties of Colloid Soil Constituent
31. Preparation of Fuel Gas and Manure by Anaerobic Fermentation of Organic Materials
32. Sample Survey for Improvement of Livestock Statistics
33. Crop Pattern for Bhakra Canal Area
34. Water Requirements of Indian Field Crops
35. Pusa Method of Wheat Production
36. Double Cropping
37. Virus Diseases of Potato and their Control
38. Soils of India
39. Reclaiming Alkali Wastelands
40. Beautifying Cities of India
41. List of I.C.A.R. Publications
42. Agricultural Practices in Ancient India (Hindi)
43. Pre-Stratification Method of Ghee-Making (Hindi)
44. Dairying in India (Hindi)
45. Livestock Products in India (Hindi)
46. Feeding of Poultry (Hindi)
47. Organic Manure (Hindi)

Periodicals

1. Indian Farming (Monthly)
2. Kheti (Hindi Monthly)
3. Indian Horticulture (Quarterly)
4. Rice New Teller (Quarterly)
5. Indian Journal of Agricultural Science (Quarterly)
6. Indian Journal of Veterinary Science and Animal Husbandry (Quarterly)
7. Statistical Newsletter (Quarterly)
8. Agricultural Research (Quarterly)
9. Indian Potato Journal (Half Yearly)
10. Indian Journal of Agricultural and Veterinary Education (Half Yearly)

Appendices 15 to 17

APPENDIX

ANNUAL ACCOUNT FOR I. C. A. R.

RECEIPTS

Head of Account	Receipt during the year	Total Receipts	Grants	
			Original B.E. Budget Estimates	New Revised Estimates
1	2	3	4	5
Opening Balance		22,71,196·10		
(1) Cash Balance	704·91			
(2) Bank Balance**	44·00		1,40,920	1,70,000
(3) Provident Fund	**20,98,047·31			
Balance	1,72,399·88		8,000	6,400
Total	22,71,196·10			
I. *Receipt under A.P.C. Act* ..	..	52,03,754·87	50,000	65,000
II. *Contribution and Grants* ..		41,11,904·00		
(a) From Constituent States ..	Nil		3,000	3,000
(b) From Central Government..	..	..	..	..
(1) Weed Control Scheme 1961-62	5,300·00		12,000	19,500
(2) Co-ordinated Scheme on 'Dairy Farming'	12,700·00		4,40,000	6,00,000
			15,000	3,000
(3) Co-ordinated Maize Breeding Scheme	6,40,000·00		2,20,600	2,58,600
(4) Project for Intensification of Regional Research on Cotton Oilseeds & Millets ..	12,37,000·00		200	250
(5) Establishment of Regional Animal Nutrition Centre ..	2,01,359·00		1,00,000	54,000
(6) Production of Agricultural Films	2,00,000·00		5,000	3,500
(7) Co-ordinated Scheme for improvement of Sheep and Wool on Regional basis ..	2,25,000·00		3,000	22,800
(8) Co-ordinated Cattle Sterility Scheme	10,000·00		25,000	13,000

15

THE YEAR 1961-62

(RESEARCH SIDE)

PAYMENTS

Head of Account	Actuals	Excess (—) or Savings (+) over net grants (Difference)	Remarks
6	7	8	9
REVENUE			(a) Inconsiderable
A—*Standing Charges*			
Accounts and Audit	1,63,757·23	(+) 6,242·77	(a)
Travelling Allowance of non-official members of the Council ..	6,493·03	(—) 93·03	(a)
Travelling Allowance of members of the Committee of the Advisory Board and other persons invited to attend the meetings	65,252·65	(—) 252·65	(a)
T.A. of non-official members of the Board of Agriculture and A H. in India	3,003·46	(—) 3·46	(a)
Miscellaneous Grant of V.P. ..	20,813·45	(—) 1,313·45	(a)
Editorial Scheme	6,05,436·65	(—) 5,436·65	(a)
Subsidies to various Journals	3,000·00	..	..
Integrated Statistical Scheme ..	2,56,034·63	(+) 2,565·37	(a)
Publication of abstracts for Indian Journal of Veterinary Science ..	100·00	(+) 70·00	(a)
Publicity Scheme	48,779·27	(+) 5,220·72	(a)
Publication of quarterly Rice News Teller	3,441·89	(+) 58·11	..
Printing of I.J.A.S. and I.J.V.S. & A.H. at private presses	22,766·71	(+) 33·29	(a)
Publication of a quarterly popular journal on Indian Horticulture ..	12,957·25	(+) 42·75	(a)

APPENDIX

1		2	3	4	5
(9)	Pilot Survey for Study of Cultivation Practice of pepper ..	11,845·00			
(10)	Wheat Rust Control ..	6,200·00		2,000	2,100
(11)	Selective breeding and grading up of Cattle during 1961-62 ..	1,00,000·00		80,000	40,000
				75,200	86,000
(12)	Cross-Breeding of Cattle 1961-62	1,60,000·00		60,000	55,000
(13)	Comparative Value of grading up with Sindhi and Cross-breeding other Jersey bulls for increased Milk Production	45,000·00		30,000	35,000
(14)	Artificial Insemination Centre, Bangalore, 1961-62 ..	72,000·00		1,40,200	1,30,000
(15)	National Index of Field Experiments	90,000·00		50,260	57,500
(16)	Camel Breeding Scheme, Rajasthan 1961-62 ..	52,200·00		3,000	200
(17)	Research & Development of pepper and Cashewnuts 1961–62	46,400·00		20,000	22,000
(18)	Additional Facilities at the Institute of I.A.R.S. ..	21,000·00			
(19)	Intensive Distt. Agricultural Programme	27,300·00			
(20)	Scheme for the study of milk yield breeds and management practice of bovines ..	1,00,000·00	..	..	200
(21)	Pilot scheme for study of feeding and rearing practice of sheep and yield of wool ..	1,66,000·00		5,000	300
				5,000	6,400
(22)	Pilot investigation for collection of statistical data on yield and extent of cashewnut cultivation and practice adopted in its cultivation ..	40,800·00	..	14,720 ..	6,400 1,100
(23)	Study and incidence of pests and diseases on rice ..	59,400·00	..	8,600	100
(24)	Manurial & Agronomic trials	73,000·00	..	1,000	..
(25)	National Horotorium ..	2,14,700·00	..	1,000	..

15 Contd.

6	7	8	9
Printing of quarterly Journal Statistical News Letter.. ..	2,532·18	(—) 432·18	(a)
Printing of Kheti	39,206·98	(+) 792·02	(a)
Publication of Indian Farming (Integrated Publicity Works) ..	86,119·21	(—) 119·21	(a)
Maintenance of Statt. Wing Building	55,560·99	(—) 560·99	(a)
Award of Fellowship to Diploma Course students in Agri. Statistics ..	35,062·86	(—) 62·86	(a)
Establishment of a central distribution Section for the publications of the Council	1,24,901·25	(+) 5,090·75	(a)
Library Scheme	55,304·37	(+) 1,695·63	(a) Inconsiderable
Research workers Conference on Agri. and A H.	239·00	(—) 39·00	(a)
Description of different varieties of fruits	21,668·48	(+) 331·52	(a)
Total Standing Charge ..	16,32,511·54	..	..
B—*Research Training and Publicity under Direct Control of I.C.A.R.*			
(i) **AGRICULTURE**			
Co-ordinated grass land survey scheme	205·50	(—) 5·50	(a)
Seminar on wheat, I.C.A.R. ..	231·92	(+) 68·08	(a)
Fourth Conference of Horti. Research Workers	6,313·16	(+) 86·84	(a)
Ad hoc Committee on Rice under I.C.A.R. Rice Committee ..	6,322·60	(+) 77·40	(a)
Spices and Cashewnut Show ..	759·99	(+) 340·01	(a)
Scheme for preparing Agril. Hand-book for India	12·15	(+) 87·85	(a)
Assignment of a Horticulture Expert from France	..	..	..
Installation of steam injectors to induce artificial rains	..	..	..

APPENDIX

	1	2	3	4	5
(26)	Cost of Milk Production ..	1,13,200·00			
(27)	Study of poultry practice and Production	70,000·00	..	5,000	..
				19,000	..
(28)	Pilot investigation for collection of Statistical data on yield and extent of cardamom cultivation and on the practices adopted in its cultivation ..	90,000·00	..	500 1,000	500 ..
(29)	Survey of Fertilizer & Manuring practices	21,500·00	..	..	..
		..	..	..	1,400
		..	..	35,000	40,300
(c)	OTHER GRANTS FOR SPECIAL SCHEMES	..	63,917·38	2,000	..
(1)	Indian Central Jute Committee, Calcutta	2,000·00	..	..	..
(2)	I.C.O.C., Hyderabad ..	23,710·00	..	6,000	800
(3)	I.C.C.C., Ernakulam ..	2,000·00	..	2,000	..
(4)	Grant received under T.C.M. Programme in shape of implements etc.	6,207·38	..	73,000	60,500
(5)	Production of Agril. Films (Films Pool)	30,000·00	..	..	..
III.	*Interest from Investments* ..	..	8,21,432·05	43,770	42,000
				2,000	8,000
(1)	2¾ % Loan 1962	26,059·50	..	..	..
(2)	3 % Loan, 1963-65 ..	49,361·00	..	..	..
				7,200	..
(3)	3¾ % Loan, 1974 ..	1,33,245·00	..	..	..
				32,200	14,000
(4)	4% Loan, 1972	74,248·00			
(5)	3% Loan, 1970-75 ..	1,88,808·50	..	..	..
				15,270	..
(6)	3½% Government National Plan Bonds, 1961 ..	17,655·25	..	..	..
(7)	Fixed Deposits etc. ..	Nil	..	..	..
(8)	Interest on current a/c. ..	2,328·04	..	5,000	22,700
(9)	Interest on S.T.D. ..	2,27,780·81	..	..	..
(10)	4% Loan 1979	26,397·00	..	2,000	..

15 Contd.

6	7	8	9
Sprinkler irrigation	..	..	..
Review of Agronomic practices in the States	..	..	..
Seminar on recent advances in Agronomy & Soil Science	452·00	(+) 48·00	(a)
Fifth assignment of Dr. R. O. Whyte, F.A.O. Grassland Expert ..	..	..	..
Conference of Entomological and Mycological Research Workers ..	1,312·00	(+) 88·00	(a)
All India Fruit Shows	40,273·49	(+) 26·51	(a)
Publication of illustrated bulletins giving information about cultivation of individual drug plants ..	..	..	..
Donation of cups in flower shows in different regions	775·00	(+) 25·00	(a)
Preparation of a book on flower annuals by Shri L. Desai	..	..	(a) Inconsiderable
Investigation into the method and practices of Farming	60,489·04	(+) 10·96	(a)
Co-ordination of Research ..	41,861·53	(+) 38·47	(a)
Survey for the assessment of possibilities of cut flower business	7,930·65	(+) 69·35	(a)
Seed Atlas, I.C.A.R.	..	..	..
Preparation of Vegetation maps of India	14,539·91	(—) 539·91	(a)
Establishment of a National Registration authority for the cultivated and wild fruit plants I.C.A.R. ..	..	..	..
Implementation of Shri Mori's report on Floriculture in India	22,631·49	(+) 68·51	(a)
Seminar on diseases of Horticultural Plants	..	..	..

APPENDIX

1		2	3	4	5
(11)	4% Loan, 1980	3,587·00	..		
(12)	4% Loan, 1981	71,961·75	..	13,500	..
IV.	*Misc. Receipts*	..	9,68,478·41	..	300
(1)	Receipts realised from schemes	1,29,857·38	..	..	2,500
(2)	Receipts on account of unspent balances of grants made by the Council	1,50,217·02	..	30,750	..
IV.		..	..	1,200	..
(a)	Sale of publications ..	5,16,575·50**	..	..	..
(b)	Advertisements	43,749·14	..	..	..
(c)	Hostel rent	9,866·06	..	..	5,600
(d)	Receipts realised from Pirrcom Scheme	59,117·94	..	..	..
(e)	Disposal of articles ..	1,900·73	..	..	4,300
(f)	Miscellaneous	57,185·64	..	..	..
	Total ..	9,68,478·41	..	..	12,800
	**Revolving Fund Publications.	94,229·37	..	..	..
	Other Publications ..	4,22,346·13			200
		5,16,575·50			
V.	*Debts and Remittances* ..	..	..	..	..
(1)	Loans and Advances ..	15,624·25	..	..	..
(2)	Deposits & Advances repayable	1,81,788·88	..	13,110	29,750
(3)	Other deposits and advances repayable	21,094·00	..	..	..
(4)	Recoveries from Research Side Staff account of Income Tax Provident Fund etc. ..	75,083·38	..	1,000 2,000	.. 15,400
	Total ..	2,93,590·51	..	..	..
	Total Receipts and Opening balance	..	137,34,273·32	27,800 ..	16,800 ..

15—Contd.

6	7	8	9
Award of rewards to outstanding benefactors in Agri. and Hort., I.C.A.R.	..	..	..
Plant Introduction Work ..	296·30	(+) 3·70	(a)
Seminar on Fruit and Vegetable Preservation, I.C.A.R.	2,446·84	(+) 53·16	(a)
Acceleration of research work on Hybrid Maize and Jowar Breeding, I.C.A.R.	..	..	..
Provision of nucleus staff to assist the Sorghum Specialist in collection of various varieties of Jowar and their maintenance	..	..	..
Seminar on designs, development and testing of improved agril. implements	5,601·33	(—) 1·33	(a)
Seminar on green manuring 1961-62 Seminar on Plant Protection, 1961-62	4,223·80	(+) 76·20	(a)
Establishment of small Agril. Unit at Leh.	12,800·00	..	..
Research Workers Conference on Millets	195·20	(+) 4·80	(a)
Total	2,29,673·90		
II. ANIMAL HUSBANDRY			(a)
Appointment of a Liaison Officer for Sheep and Wool Schemes ..	28,766·53	983·47	(a)
Manual on preparation of animals for Indian Markets	..	..	..
Survey of the Yak and Cattle breeding operations in the interior hilly areas	15,349·56	(+) 50·44	(a)
Co-ordination of Research on A. H. Creation of Coordinated Units ..	16,712·34	(+) 87·66	(a)

APPENDIX

1	2	3	4	5
Add: Investments and Re-investments:		107,61,400·00	500	..
Grand Total		244,95,673·32	2,000	15,000
			..	300
			..	300
			..	1,100
			2,000	9,000
			10,000	10,000
			5,000	2,000
			1,000	..
			..	..
			64,410	
			7,03,000	53,000
			1,14,000	1,400
			10,00,000	..
			500	5,500
			20,000	31,200
			..	8,000
			38,340	30,000
			55,000	58,000

15—Contd.

6	7	8	9
Manual on 'Breeding of Farm animals in India'	..	..	..
Intensified supervision and co-ordination on cattle breeding ..	15,887·47	(—) 887·47	(a)
Preparation of a compendium on the animal nutrition investigation in West Bengal, I.C.A.R. ..	285·79	(+) 14·21	(a)
Camel Survey Scheme	233·56	(+) 66·44	(a)
Physiological genetics of different breeds of cattle under adverse environmental conditions, West Bengal ..	1,085·37	(+) 14·63	(a)
Definition of Commercial evolution of Graded Wools of Sheep brands ..	8,903·41	(+) 96·59	(a)
Expansion of central herd-book section	9,639·22	(+) 360·78	(a)
Definition of ideal animal ..	1,907·18	(+) 92·82	(a)
Monograph on 'Statistical Methods in A.H.'	..	..	..
Dairy Research Workers' Conference	362·64	(—) 362·64	(b)
Total ..	99,133·07		

(a) Inconsiderable
(b) Demand received very late during the year

III. MISCELLANEOUS

Revolving Fund	52,605·03	(+) 394·97	(a)
Publication of Books in Hindi and Regional languages	1,346·64	(+) 53·36	(a)
Pilot projects for testing the results of Research on Commercial scale ..	..	..	..
Sale arrangements of the monographs of Commodity Committees ..	5,498·80	(+) 1·20	(a)
Utilisation of the services of retired scientists in the field of Agri., A.H. and allied sciences, I.C.A.R. ..	31,179·85	(+) 20·15	(a)
Printing of all-India Survey report on Indigenous Agril. Implements in the Country	7,744·50	(+) 255·50	(a)
Building of the I.C.A.R.	29,981·32	(+) 18·68	(a)
Indian Council of Agril. and Veterinary Education	58,544·81	(—) 544·81	(a)

APPENDIX

1	2	3	4	5
			27,320	..
			7,000	..
			1,12,380	48,000
			..	400
			6,520	5,260
			5,000	500
			20,000	7,900
			2,000	500
			10,000	10,200
			1,230	500
			..	5,000
			11,160	..
			2,000	..
			10,000	6,000
			2,000	..
			22,300	..
			11,060	..
			..	5,000
			10,000	29,500

15—Contd.

6	7	8	9
Publicity campaign on Fertilisers ..	..	..	..
Scheme of Potash requirements for cotton and other crops ..	..	..	..
Supply of Agriculture Information literature to the National Extension Service Blocks	47,978·34	(+) 21·66	(a)
Participation of the Council in world Agril. Fair	335·86	(+) 64·14	(a)
Duplicating Section	5,211·29	(+) 48·71	(a)
Payment of Honorarium to authors for the preparation and revision of monographs to be printed at the G.O.I. presses, I.C.A.R.	462·28	(+) 37·72	(a)
Printing of bulletins to be subsidised by the Council	7,845·10	(+) 54·90	(a)
Award of prizes for improvement in Agril. Implements	437·72	(+) 72·28	(a)
Award of prizes for outstanding Research Work done in the field of Agri. and A.H. and Allied Sciences	10,150·00	(+) 50·00	(a)
Proposal to invite eminent statisticians under Colombo Plan	448·00	(+) 52·00	(a)
Survey of Additional indigenous Agril. implements	4,527·97	(+) 472·03	(a)
Statistical Analysis of Data of Co-ordinated Scheme for survey of Bacteriological qualities of Milk Supply	..	..	..
Conference of Research Workers on Plant Physiology 1960, I.C.A.R. ..	..	..	..
Pilot Sample Investigation on the cultivation practices and yield of mango crops	5,943·25	(+) 56·75	(a)
Printing of the monograph on veterinary entomology and acarology for India	..	..	..
Fellowships in Statistics	(—) 65·49	..	of last year amount received back
Hand-book of Indian Fodder and Forage Crops	..	..	..
Symposium on Algae	4,870·04	(+) 129·96	(a)
Estimation of cost of Production of Cotton and other Rotation Crops ..	29,529·72	(—) 29·72	(a)

APPENDIX

1	2	3	4	5
			2,000	..
			15,750	28,920
			4,000	..
			4,500	2,900
			2,200	7,700
			1,000	..
			2,000	..
			3,000	3,300
			6,000	..
			3,000	3,100
			..	900
			..	..
			7,730	5,000
			2,150	..
			4,370	9,800
			1,720	..
			7,630	9,100
			2,700	8,500
			13,240	8,000

15—Contd.

6	7	8	9
Supply of Special Publications of the Council on Subsidized rates ..	..	..	..
Pilot Scheme for maintaining research project files	28,439·76	(+) 480·24	(a)
Enquiry into factors influencing crop patterns on individual farms ..	..	..	..
Pilot enquiry for ascertaining the cost of poultry and egg production ..	2,700·00	(+) 200·00	(a)
Publication of Potato Journal ..	7,608·29	(+) 91·71	(a)
Translation into Spanish of the book 'Statistical Methods for Agricultural Workers' by Dr. Panse and Dr. Sukhatme	..	..	..
Free supply of I.C.A.R. Publications to the Various Agriculture and Veterinary Colleges in India ..	..	..	..
Publications of a quarterly journal on Agricultural Education ..	3,244·31	(+) 55·69	(a)
Institution of prize and President's Gold Medal for outstanding contribution in the field of manufacture of Agril. Implements, I.C.A.R. ..	..	..	..
Second Conference on production, dist. and popularization of improved Agril. implements, I.C.A.R. ..	3,081·88	(+) 18·12	(a)
Purchase of one additional car for the headquarters of the Council ..	876·00	(+) 24·00	(a)
Progeny testing of Murrah Bulls ..	5·30	(—) 5·30	(a)
C.—Grants-in-Aid			
I. AGRICULTURE			
RICE			
Improvement of Paddy, M.P. ..	5,100·00	(—) 100·00	(a)
–do– Kashmir ..	..	..	..
Scheme for breeding short term strains possessing seed dormancy, Madras ..	9,780·00	(+) 20·00	(a)
Blast and Foot Rot Diseases of Rice and Wheat, Bombay	..	..	..
Rice Stem Borer, Madras ..	9,100·00	..	..
–do– Hyderabad, Andhra	8,500·00	..	..
–do– West Bengal ..	8,000·00	..	..

APPENDIX

1	2	3	4	5
			16,900	8,400
			6,860	5,000
			3,000	..
			2,460	2,100
			9,170	8,400
			7,000	..
			7,880	9,000
			8,460	7,000
			1,130	7,400
			1,530	1,400
			9,580	11,000
			2,330	..
			5,000	5,000
			2,400	5,900
			10,760	7,900
			..	2,500
			10,220	7,400
			4,700	..
			2.880	..
			3,390	..
			6,900	4,000
			5,000	8,500
			..	..
			..	..

15 –Contd.

6	7	8	9
Rice Stem Borer, Andhra ..	8,400·00	..	(a)
Stem Rot Disease of Rice, Madras ..	4,900·00	(+) 100·00	Inconsiderable (a)
Boro Paddy, West Bengal ..	..	..	..
Breeding Salt and Flood Resistant varieties of Paddy, West Bengal ..	2,024·44	(+) 75·56	(a)
Scheme for work on Rice in Saline areas, Andhra	8,400·00	..	..
Cultural Studies with upland paddy, West Bengal	..	..	..
Blast Resistance of Paddy, Coimbatore, Madras	8,700·00	(+) 300·00	(a)
Micro-nutrient studies on crop plants, Madras	7,200·00	(—) 200·00	(a)
Deep water Paddy, U.P. ..	7,320·00	(+) 80·00	(a)
–do– Mysore ..	1,400·00	..	..
Scheme for evolution of Superior Saline and alkaline resistant strains, Madras	10,400·00	(+) 600·00	(a)
Scheme for the Improved Technique of Chinese Method of Paddy Cultivation U.P.	..	..	..
Hill Paddy, U.P.	4,520·00	(+) 480·00	(a)
Draught-Resistant Strains of Paddy, Kerala	5,900·00	..	..
–do– Madras	8,000·00	(—) 100·00	(a)
Paddy Helminthosporic Disease, Madras	2,500·00	..	..
Deep Water Paddy, Andhra ..	7,400·00	..	..
Rice Improvement Scheme, Kashmir	..	..	..
Improvement of Rice, H.P. ..	..	..	..
Evolving gall-fly resistant varieties of Rice, A.P.	..	..	..
Breeding varieties resistant to Piricularia, Madras	4,000·00	..	..
–do– Andhra	8,200·00	(+) 300·00	(a)
Study on Paddy Agromyzed Fly, Hyderabad, Andhra	..	..	..
Improvement of Hill Paddy, Assam..	..	..	..

APPENDIX

1	2	3	4	5
			8,000	9,000
			..	5,000
			..	500
			..	500
			..	1,000
			..	200
			..	..
			3,510	4,300
			10,170	8,300
			1,650	..
			3,000	2,500
			4,910	7,500
			6,000	..
			4,900	4,000
			6,460	6,000
			60,960	20,000
			4,430	..
			5,290	..
			7,230	2,000
			..	..
			10.000	16,000
			24,090	21,000

15—Contd.

6	7	8	9
Study of Nitrogen Fixation Blue Green Algae in Rice Soils, Madras ..	8,600·00	(+) 400·00	(a)
Scheme for cytological, anatomical and embryological studies on rice, C.R.R.I.	5,000·00	..	..
Experiment on Chinese Method of Paddy Cultivation, West Bengal ..	500·00	..	(a)
–do– Kerala ..	419·75	(+) 80·25	Inconsiderable (a)
–do– Mysore ..	1,000·00	..	..
–do– U.P. ..	177·00	(+) 23·00	(a)
–do– Orissa ..	..	..	..
Breeding non-lodging, non-shedding and flood-resistant Paddy, M.P. ..	4,300·00	..	..
Breeding Paddy for lift irrigation Areas, Andhra	8,300·00	..	..
Tabi Nurseries of Paddy, Andhra ..	..	..	..
Bacterial Blight Diseases of Paddy, Maharashtra	2,500·00	..	..
Breeding Strains Resistant to lodging of Rice, C.R.R.I.	7,500·00	..	..
Induction & Study of Amphiploidy in Rice, West Bengal	..	..	..
Investigation of false smut of Paddy, Andhra	3,800·00	(+) 200·00	..
Evolution of Paddy Strains for inundated areas, Madras	6,000·00	..	..
Evolving improved varieties of Rice, Kerala	20,000·00	..	..
WHEAT AND OTHER CEREALS			
Maize Breeding & Paddy, West Bengal	..	..	..
Selection of draught-resistant varieties of Wheat & Barley, Sikkim ..	..	..	..
Improvement of Mongori Pacha Jonna, Andhra Pradesh ..	1,900·00	(+) 100·00	..
Hybrid Corn seed, Vivekananda Laboratory, Almora	..	..	..
Improvement of Pastures and Legumes, I.A.R.I.	15,900·00	(+) 100·00	(a)
–do– Bombay ..	20,984·00	(+) 16·00	(a)

APPENDIX

1	2	3	4	5
			15,000	..
			68,400	..
			72,730	..
			29,600	..
			28,000	200
			35,250	..
			31,500	3,400
			30,500	..
			1,900	..
			67,060	..
			19,000	16,000
			23,400	..
			20,400	..
			41,700	..
			28,800	..
			2,400	..
			12,330	..
			6,230	2,500
			1,700	..
			1,340	7,400
			..	2,500
			8,200	6,000
			9,620	..
			620	8,200
			8,000	7,500

15 –Contd.

6	7	8	9
Hybrid Maize, Mysore	..	..	..
Co-ordinated Maize Breeding Scheme, I.A.R.I.	..	..	..
–do– Kashmir ..	..	..	..
–do– Mysore ..	..	..	..
–do– West Bengal ..	200·00	..	..
–do– Bihar ..	..	..	..
–do– Punjab ..	3,376·60	(+) 23·40	(a)
–do– Gujarat ..	..	..	..
Studies on helminthosporium diseases of wheat, W. Bengal ..	..	..	..
Co-ordinated Maize Breeding Scheme U.P.	..	..	..
Studies on Wheat, Poona ..	16,000·00	..	..
Co-ordinated Maize Breeding, Rajasthan			
–do– Vivekananda Laboratory, Almora	..	..	..
–do– Andhra ..	..	..	..
–do– M.P. ..	..	..	..
–do– Punjab (Kangra)	..	..	..
Development of Suitable Nutritions, Pasture Grasses and Legumes at different Altitudes and Climatic Conditions, Punjab ..	..	..	..
Fodder Production under Rain-fed and Irrigated Conditions, Kerala ..	2,500·00	..	..
Fundamental Studies in Embryo & Organ Culture Presidency College, Calcutta	..	..	..
Research on fodder production, West Bengal	7,381·50	(+) 18·50	(a)
–do– Bhopal (M.P.)	2,484·25	(+) 15·75	(a)
Research on Fodder Production, Bihar	6,000·00	..	(a) Inconsiderable
–do– Mysore ..	..	..	..
–do– Coorg (Mysore)	8,200·00	..	..
–do– Andhra ..	7,500·00	..	..

APPENDIX

1	2	3	4	5
			7,000	..
			1,000	5,500
			..	5,500
			6,590	..
			10,200	..
			12,900	10
			780	..
			5,550	10,000
			4,100	3,700
			34,500	8,600
			10,600	..
			5,470	4,900
			3,140	5,000
			4,000	..
			5,600	7,500
			6,790	..
			4,960	..
			12,240	..
			2,930	..
			1,080	5,800
			3,110	1,300
			4,920	4,900

15—Contd.

6	7	8	9
Research on Fodder Production, Madras	..	..	..
Cytology of Indian Grasses, M.P. ..	5,500·00	..	..
Scheme for Cytological, Anatomical and Embryological Studies on Wheat, Maize, Phaseolus and Cajanus, New Delhi	5,500·00	..	..
Hybrid Jowar, Almora, U. P. ..	..	..	..
Improvement of Pasture Grasses & Legume, Dharwar, Mysore ..	..	..	..
Production of Hybrid Maize Seed at C.M.F., Suratgarh	5·73	(+) 4·27	(a)
Cytogenetical Studies on Maize, Andhra University	..	..	..
Investigation of the Nutritive Value of Indian Hybrid Maize Varieties, Lady Irwin College, New Delhi ..	10,050·00	(—) 50·00	(a)
Opening of one Wheat Breeding Station at Washim in Vidarbha, Bombay ..	3,600·00	(+) 100·00	(a)
Co-ordinated Maize Breeding, Sikkim	8,549·52	(+) 50·48	(a)
Cytogenetics of Leguminous Crops Presidency College, Calcutta ..	..	..	..
Cytogenetics of Wild Grasses, Madras	4,900·00	..	..
Control of Wilt of Maize, Bihar ..	5,000·00	..	..
Drought Resistance in Wheat, M.P. ..	..	..	..
MILLETS AND PULSES			
Pulse Breeding, M.P., (Gwalior) ..	7,500·00	..	..
–do– Mysore ..	..	..	..
Hybrid Bajra, Bombay	..	..	..
Hybrid Cumbu, Madras ..	..	..	..
Jowar and Bajra Breeding, Saurashtra	..	..	..
Diseases of Bajra, Anand Institute ..	5,760·00	(+) 40·00	(a)
Pests of Pulses with Special Reference to Biochemic & Control Aspects, Madras	1,300·00	..	..
Draught Resistant Strains of Sorghum, Madras	4,900·00	..	..

APPENDIX

1	2	3	4	5
			..	5,000
			3,900	..
			5,400	..
			2,570	..
			3,350	7,500
			6,580	6,200
			6,020	2,200
			4,000	2,000
			3,640	..
			8,170	5,000
			7,500	7,800
			2,070	2,800
			2,030	..
			6,000	..
			7,000	..
			14,220	..
			20,330	..
			10,100	..
			11,000	6,200
			20,000	10,000
			11,600	5,000
			21,350	10,000
			13,140	10,000
			9,290	4,400
			8,500	..

15—Contd.

6	7	8	9
Improvement of Gram and Bajra, Punjab	5,000·00	..	..
Improvement of Jowar, U.P. ..	..	..	..
–do– Bajra, U.P. ..	..	..	..
Control of Ergot of Bajra, Maharashtra	..	..	..
Improvement of Millets (Jowar, Bajra and Ragi), A.P.	7,500·00	..	..
Evolution of New Varieties of *Dolichos Lablab*, Coimbatore, Madras ..	6,200·00	..	..
Improvement of Pulses, Kerala ..	2,200·00	..	..
Scheme for Investigation Embryology of Indian Pulses at Vidarbha Maha Vidyalaya, Amravati (Bombay) ..	2,000·00	..	..
Small Millets, Mysore	..	..	(a) Inconsiderable
Pulse Research, Assam	5,000·00	..	..
Improvement of Pulses, Andhra ..	7,800·00	..	..
Pulse Breeding, Orissa	2,768·00	(+) 32·00	(a)
–do– Andhra ..	..	..	..
FRUITS			
Horticulture Tharsa, Bombay	..	..	..
–do– Orissa	..	..	..
–do– Hyderabad (Andhra)	..	..	..
–do– Mysore	..	..	..
–do– H.P.	..	..	..
Virus Diseases and Other Disorders of Stone Hill Fruits, D.S.B. College, Nainital, U.P.	6,200·00	..	..
Banana Research, Madras ..	10,000·00	..	..
–do– Bombay ..	5,000·00	..	..
–do– West Bengal ..	10,000·00	..	..
–do– Andhra ..	9,000·00	(+) 1,000·00	(a)
Citrus Manurial Trials, Punjab ..	4,400·00	..	..
Remedial Measures against Sanjose Scale of Kashmir	..	..	..

APPENDIX

1	2	3	4	5
			20,000	..
			10,000	..
			2,600	2,400
			390	..
			820	..
			1,400	..
			2,800	3,000
			6,100	4,000
			15,000	..
			4,190	5,000
			6,900	5,000
			8,400	7,000
			5,780	4,000
			13,440	10,000
			3,880	4,000
			13,880	10,000
			34,000	..
			50,940	16,000
			7,900	..
			5,000	3,000
			4,300	..
			4,100	..
			4,100	1,700

15—Contd.

6	7	8	9
Establishment of Horticultural Plant Introduction Station at Saharanpur, U.P.	..	..	..
—do— Hassarghatha, Mysore ..	..	..	..
Cytogenetical Studies on Grapes and Related Wild Spices, Madras ..	2,400·00	..	..
Investigation of Root Rot, Limb Breakage, Andhra	..	..	..
Control of Fruit Crop in Mandarin Oranges, Tripura	..	..	..
Study of Orange Pests, West Bengal	..	..	..
Investigation on the pests of important fruit crops, Madras	3,000·00	..	..
Investigation on the root rot and collar diseases of Apple, H.P. ..	4,000·00	..	..
Pilot Project for the amelioration of the die-back disease of Citrus, Sikkim	..	..	..
Cultivation of Apple, Madras ..	5,000·00	..	..
Research on Pineapples, W. Bengal	5,000·00	..	..
Citrus root stock trials, Andhra ..	7,000·00	..	..
Orange Research, Kerala ..	4,000·00	..	..
Anab Shahi Grape Cultivation, Andhra	10,000·00	..	..
Banana Research Sub-Station, East Khandesh, Poona	4,000·00	..	..
Papaya Research Station, Bombay ..	10,000·00	..	..
Co-ordinated Study for the application of growth regulating substances in horticulture, Punjab	..	..	..
—do— Andhra ..	16,000·00	..	..
—do— I.C.C.C. ..	..	..	..
—do— Kerala ..	3,000·00	..	..
Cytogenetical investigation on Banana, Anona, Guava and Pomegranate, Agriculture College and Research Institute, Coimbatore	..	..	..
Research on olive and pomegranate, Himachal Pradesh	..	..	..
Research on Grapes, Madras ..	1,700·00	..	..

APPENDIX

1	2	3	4	5
			1,400	..
			15,000	7,400
			8,900	5,000
			6,500	7,000
			5,000	4,000
			..	30,000
			19,700	..
			39,010	1,00,000
			70,000	50,000
			6,980	4,000
			14,390	..
			..	200
			8,300	..
			1,300	1,400
			2,100	..
			2,200	..
			10,420	..
			3,900	..
			2,600	..
			6,360	7,100
			4,800	..
			11,090	7,200

15—Contd.

6	7	8	9
Study of Vegetative and productive growth in guava trees, Aligarh University	..	..	..
Banana Research, Kerala ..	7,400·00	..	..
Research on Pineapple Kerala ..	5,000·00	..	..
Improvement and Stabilisation of off-Season bearing of Mango in Kanya Kumari, Madras	7,000·00	..	(a) ..
Wilt Disease of Guava, West Bengal	4,000·00	..	..
Research in Fruits, Kashmir ..	22,900·00	(+) 7,100·00	(a)
Investigation in die-back disease of Citrus, I.A.R.I.	..	..	..
–do– Coorg (Mysore)	1,00,000·00	..	..
–do– Bombay ..	49,952·00	(+) 48·00	(a) Inconsiderable
Sub-humid Tropical Fruit Research Station, Andhra	4,000·00	..	..
Improvement of Date Palm, Punjab ..	..	..	..
Establishment of Fruit Research Stations in Plains, U.P.	167·00	(+) 33·00	..
Mycological and Entomological Investigation of Fruit, Uttar Pradesh ..	..	..	..
Studies on the control of citrus canker, Annamalai University	1,350·00	(+) 50·00	..
Investigation of twig-blight diseases of Orange, West Bengal ..	..	..	..
Physiology and growth reproduction with special reference to problem of bye-chemical bearing in Mango Calcutta University, West Bengal	..	..	..
Horticultural investigation, U. P. (Chaubattia)	..	..	..
Co-ordinated Scheme on the effect of Chemicals in the storage of Fruit and Vegetables, C.F.T.R.I. ..	..	..	..
–do– Punjab ..	..	..	..
Research on Cashewnuts, Andhra ..	7,076·00	(+) 24·00	(a)
–do– Bombay ..	..	..	..
Bunchy top disease of Banana, Travancore Cochin, Kerala	7,108·84	(+) 91·16	(a)

APPENDIX

1	2	3	4	5
			14,090	9,000
			8,450	..
			4,100	3,300
			7,690	2,300
			2,500	..
			..	4,500
			7,400	..
			11,470	..
			6,000	5,000
			10,140	15,000
			15,250	10,000
			6,830	7,000
			2,000	2,000
			13,180	..
			2,000	..
			4,900	..
			4,900	..
			1,900	2,700
			5,680	4,000
			34,000	2,0000
			1,140	..

15—Contd.

6	7	8	9
Intensification of research on nuts, walnuts, peanuts, etc., H.P. ..	9,000·00	..	..
Selection of nucellar root stocks in citrus species, U.P.	..	..	..
Improvement of Ber Fruit, M.P. ..	3,218·11	(+) 81·89	(a)
–do– PEPSU (Punjab) ..	2,300·00	..	..
–do– Ajmer (Rajasthan)	..	..	..
Improvement of ber fruit trees, PEPSU (Punjab)	4,500·00	..	..
Improvement of pineapple by application of growth regulating substances (Gauhati University) Assam ..	..	..	..
Research on Pests of Vegetables and Fruit Trees, Punjab	..	..	..
Research on pests of citrus, Aurangabad, Bombay	5,000·00	..	..
Intensification of Research on sub-tropical fruits in lower hills of Valley Area, H.P. ..	15,000·00	..	..
Research on Raisin Grapes Lahaul Valley, Punjab	10,000·00	..	..
Banana Diseases, Madras ..	7,000·00	..	..
Fruit preservation, Annamalai University	2,000·00	..	..
Chlorosis of Banana, Bombay ..	..	..	..
Evolution of new varieties of Mango, Grapes and Citrus, Punjab ..	..	..	..
Establishment of Sub-Station of Wet Land Banana, Madras	..	..	..
Establishment of Sub-Station for Hill Banana, Madras	..	..	..
Improvement of Ber Fruit, Gujarat	2,700·00	..	..
Physiological Studies on Factors governing root formation in cutting and layering of fruits, Calcutta University	4,000·00	..	..
Co-ordinated Scheme for the improvement of musk melon and water melon, I.A.R.I.	20,000·00	..	(a) Inconsiderable
Training in Fruit Preservation, Bihar	..	..	..

APPENDIX

1	2	3	4	5
			11,160	15,200
			2,000	6,000
			1,000	8,000
			2,500	200
			2,670	2,500
			10,820	6,000
			4,360	..
			4,800	4,800
			240	8,700
			18,000	27,000
			2,000	1,500
			4,000	..
			2,000	4,000
			6,400	5,000
			5,210	4,600
			6,500	11,000
			8,000	4,000
			6,430	17,000
			10,560	13,800
			6,300	10,000
			..	..
			5,640	2,000
			3,900	3,000
			6,950	..

15—Contd.

6	7	8	9
Research on Cashewnuts, Mysore ..	15,191·24	(+) 8·76	(a)
–do– Kerala ..	5,822·95	(+) 177·05	(a)
VEGETABLES			
Tuber Crops, Bihar	8,000·00	..	..
Anatomical and Embryological Studies in Potato, C.P.R.I. ..	175·65	(+) 24·35	(a)
Improvement of Perennial Vegetables, Madras	2,500·00	..	..
Improvement of Vegetables, Assam ..	6,000·00	..	..
Development of Mushroom Cultivation, H.P.	..	..	..
Cytological studies of common vegetables, Calcutta University ..	4,800·00	..	..
Tuber Crops and Related Plants, Kerala University.	8,620·00	(+) 80·00	(a)
Tapioca and Sweet Potato Travancore Cochin, Kerala	22,680·67	(+) 4310·33	(a)
Improvement of Vegetables, Bombay	1,449·94	(+) 50·06	(a)
–do– U.P. ..	1·00	(−) 1·00	(a)
–do– PEPSU (Punjab)	4,000·00	..	..
Onion Research, Andhra ..	5,000·00	..	..
Improvement of Onion and Garlic, West Bengal	4,583·63	(+) 16·37	(a)
Vegetable Research Station, Andhra	11,000·00	..	..
Improvement of Vegetables, Madras	13,873·88	(+) 126·12	(a)
–do– Punjab ..	7,000·00	..	..
–do– Hyderabad, Andhra ..	13,155·00	(+) 645·00	(a)
–do– West Bengal ..	10,000·00	..	..
–do– V.P. (M.P.) ..	(−) 867·43	..	..
Trials on the Production of sugar beets, H.P.	2,000·00	..	..
Cytogenetical Investigation of the important cucurbitaceous vegetables of Eastern India, Calcutta University	3,000·00	..	..
Improvement of Vegetables, Sikkim ..	..	..	..

APPENDIX

1	2	3	4	5
			10,410	15,000
			4,930	5,000
			4,950	3,000
			6,160	6,200
			3,430	..
			4,360	..
			4,290	4,800
			5,460	1,200
			3,000	2,700
			32,930	..
			10,000	4,700
			3,680	..
			14,000	39,600
			6,320	11,800
			3,470	..
			14,650	14,000
			8,830	2,000
			20,120	52,500
			2,920	..
			760	..
			12,960	11,000
			3,400	..
			3,300	..
			38,630	..

15—Contd.

6	7	8	9
Production of foundation seeds of Temperate Region Vegetables, H.P.	15,000·00	..	..
Onion Research, Bombay ..	5,000·00	..	..
Agronomic Investigation on few important Vegetables, Poona	3,000·00	..	..
Investigation of Agronomical requirement of Improved Strains of Vegetable Crops, Anand	8,200·00	(—) 2,000·00	(c) Demand received in excess than anticipated
Cultivation of Singhara, Orissa ..	..	..	..
OTHER CROPS			
Chillies Research, I.A.R.I. ..	..	..	..
–do– Mysore ..	4,769·06	(+) 30·94	(a)
–do– Madras ..	1,186·56	(+) 13·44	(a)
Ginger Research, Kerala ..	2,700·00	..	..
Medicinal Plants Assam ..	..	..	..
–do– F.R.I. ..	4,700·00	..	(a) Inconsiderable
–do– Kashmir ..	..	..	..
–do– W. Bengal ..	39,552·80	(+) 47·20	(a)
Cultivation of Kuth in the Lam Valley, Punjab	11,800·00	..	..
Development of Pyrothrum cultivation in India, Kashmir ..	..	..	..
Pepper Research, Penniyur, Kerala ..	14,000·00	..	..
Establishment of Pepper Research Station, Mysore	2,000·00	..	..
Establishment of Regional Spices Research Station, Coorg, Mysore ..	52,486·00	(+) 14·00	(a)
Cultivation and Development of Ginger, Kerala	..	..	..
Spices, West Bengal	..	..	..
Cloves, Nutmeg and Coco, Madras	11,000·00	..	..
Turmeric Research (Revised), Orissa	..	..	..
Botanical improvement of the essential oil-yielding plants, I.A.R.I. ..	..	..	..
Establishment of a Research Station for Cardamom, Kerala ..	..	..	..

APPENDIX

1	2	3	4	5
			11,660	..
			18,730	..
			2,570	..
			2,750	..
			31,190	..
			2,000	4,100
			7,000	3,700
			..	300
			5,000	3,000
			8,000	6,200
			110	..
			10,000	6,800
			6,050	..
			5,460	10,000
			7,000	5,000
			6,760	7,000
			9,670	6,400
			2,440	..
			1,880	..
			2,140	2,000
			2,000	..
			2,800	2,800
			6,060	2,000
			12,260	..

15—Contd.

6	7	8	9
Establishment of a Research Station for Cardamom, Mysore.. ..	..	..	..
Establishment of Research Station of Pepper, Kerala	..	..	..
Turmeric, Andhra	..	..	..
Ginger, Assam	..	..	..
Composite Research Station for Pepper and Cardamom and Cashewnut, Assam	..	..	..
Chillies, West Bengal	4,012·75	(+) 87·25	(a)
–do– Vidarbha (Maharashtra) ..	3,667·43	(+) 32·57	(a)
–do– Andhra	240·00	(+) 60·00	(a)
–do– (Hyderabad) Andhra ..	3,000·00	..	..
Improvement of Lemon Grass, Kerala	6,117·06	(+) 82·94	(a)
Research on Pepper and Cardamom, Orissa	..	..	..
Scheme for Research and Development of Vanilla Cultivation, Kerala ..	6,800·00	..	..
Cultivation of Camphor in Wynad, Kerala	..	..	..
Scheme for cultivation of medicinal plants in Cinchona Plantations, Madras	10,000·00	..	..
Ginger Research Scheme in the Himalayan Areas, West Bengal ..	5,000·00	..	(a) Inconsiderable ..
Root Crops, W. Bengal ..	7,000·00	..	..
Spices, Delhi University ..	6,335·72	(+) 64·28	(a)
Medicinal Plants, Punjab ..	..	..	..
Research on Linjaloe, Madras ..	..	..	..
Improvement of condiments, W. Bengal	2,000·00	..	..
–do– Madras ..	..	..	..
Improvement of Ginger and Turmeric, Punjab	2,900·00	(—) 100·00	(a)
SOILS AND MANURES			
Micro-nutrients Studies in the Soils, Punjab	2,000·00	..	..
Collection of Soil Survey data, I.A.R.I.	..	..	..

APPENDIX

1	2	3	4	5
			5,000	9,000
			7,630	14,000
			360	..
			7,210	..
			1,890	4,000
			20,000	10,700
			6,300	21,700
			2,000	1,900
			2,230	2,200
			5,550	6,800
			2,000	2,000
			8,200	10,300
			12,690	5,800
			3,840	..
			170	1,200
			5,000	5,200
			1,130	..
			1,000	..
			2,440	..
			2,490	..
			4,660	..
			..	4,000

15—Contd.

6	7	8	9
Usarland Reclamations, Punjab ..	9,000·00	..	..
Soil Standardisations method, Bombay	14,000·00	..	..
Soil and Plant Growth, Agra ..	..	..	..
Nitrogen Fixation in Soils, M.P. ..	..	..	..
Foliar application of Nutrient to Crops I.A.R.I.	4,000·00	..	..
Study of Fertility index of soils field Research Station, Bombay ..	10,700·00	..	..
Investigation of Kharland in Bombay State, Bombay	21,700·00	..	..
Comparative Efficiency of Ammonial and Nitrates Fertilizer on Paddy, C.R.R.I.	1,900·00	..	..
Soil Structure Studies, Punjab ..	2,200·00	..	..
Scheme for Studies on soil Structure in A.P.	6,720·04	(+) 79·36	(a)
Ammonium Sulphate to Paddy lands, W. Bengal	2,000·00	..	..
Salinity Research Scheme B.R. College, Agra	10,249·00	(+) 51·00	(a)
Chemical Micro-biological and Agronomic Studies on the soils of Kuttanaud, Kerala	5,800·00	..	..
Soil Erosion, Rajasthan, Jaipur ..	..	..	..
Storage of Fertilizer, I.A.R.I. ..	1,156·61	(+) 43·39	(a)
Nitrogen Fixation in Soil, Sheila Dhar Institute	5,130	(+) 70·00	..
Rapid Soil Test, I.A.R.I. ..	..	..	..
Studies in the cost of reclamation of Kalar (Alkali) lands, Khalsa College, Amritsar, Punjab	..	..	..
Possibilities of using carbons in improvement and reclamation of soil, Punjab University	..	..	..
Trace element in Indian Soils (Revised) I.A.R.I.	..	..	..
Working out the method of application of liquid ammonia under village condition, Bihar	..	..	..
Scheme for studies on acid soil of Kerala	4,000·00	..	..

APPENDIX

1	2	3	4	5
			1,700	..
			6,230	..
			2,640	..
			..	3,700
			1,500	..
			4,600	..
			51,900	..
			24,500	22,000
			9,130	4,000
			3,400	..
			11,050	8,600
			2,600	..
			1,910	1,900
			4,800	6,800
			6,570	10,000
			1,010	..
			5,290	10,000
			3,800	2,600
			7,800	7,000
			7,000	5,300
			6,520	7,100
			7,800	4,800

15—Contd.

6	7	8	9
Clay mineral contents of Indian Soils, West Bengal	..	..	..
Soil Conditioners, W. Bengal ..	..	..	..
Legume Seed Inoculation, W. Bengal	..	..	..
Nitrogen Fixation, Andhra ..	3,700·00	..	(b) Demand received very late during the year.
Working out the method of application of liquid amonia under village conditions, Mysore	..	..	..
Investigation into certain problems of soil and plant analysis, Madras ..	..	..	..
Usarland Reclamation, Lucknow ..	83,856·84	(—)83,856·84	(b)
Composition of plants in usarlands, Lucknow University	27,000·00	..	..
Phosphatic reversion in Nilgiris, Madras	4,000·00	..	..
Examining the behaviour of certain additional chemical fertilizers, I.A.R.I.	..	..	..
Reclamation of Saline and Alkaline Lands, Madras	8,600·00	..	..
Phosphorus Nutrition of Crops, Andhra	..	..	..
Treatment of Saline water for irrigation purposes, Punjab	2,000·00	(—) 100·00	(a)
Role of exchangeable bases and humus in plant nutrition, Field Research Station, Bombay	6,800·00	..	(a) Inconsiderable
Maximisation of phosphate potential in Soils, Madras	10,000·00	..	..
Nitrogen Fixation, Bombay ..	..	..	..
Reclamation of Saline and Alkaline lands, Rajasthan	10,000·00	..	..
Biological Nitrogen Fixation Bombay, Anand	2,600·00	..	..
–do– Bombay, Poona	6,800·00	(+) 200·00	(a)
–do– Punjab ..	5,300·00	..	..
Maximisation of Phosphate Potential in Soils, A.P.	7,094·27	(+) 5·73	(a)
Reclamation of Saline and Alkaline Soils, A.P.	4,800·00	..	..

APPENDIX

1	2	3	4	5
			8,750	3,000
			5,560	..
			5,300	4,700
			4,290	4,000
			5,370	..
			5,300	5,000
			10,550	4,400
			4,000	3,000
			1,500	1,700
			6,040	..
			8,000	3,600
			5,000	5,200
			3,890	..
			7,590	7,500
			11,120	16,000
			..	4,000
			130	..
			110	..
			1,300	..
			..	800
			5,100	3,300

15—Contd.

6	7	8	9
Studies on Reclamation of Saline Soils, West Bengal	3,000·00	..	..
Biological Nitrogen Fixation, W. Bengal	..	..	..
–do– A.P. ..	4,612·38	(+) 87·62	(a)
Paddy Soil, Annamalai Uty., Madras..	3,990·00	(+) 10·00	(a)
Biological and Physico-chemical studies in Paddy Soils, Madras ..	..	..	..
Co-ordinated Scheme for the use of chemical and leaf analysis as means of diagnosing nutrient requirement of crop plants, Kanpur, U.P. ..	5,000·00	..	..
–do– Andhra ..	4,400·00	..	..
Study on Foliar nutrition of Crops, Kerala	3,000·00	..	(a) Inconsiderable
Role of Legumes in the Cropping Pattern in the Coastal Region, Kerala	1,700·00	..	..
Improvement of Saline waters for irrigation purposes, Jodhpur ..	..	..	..
Micro-nutrients studies of Soils, Gujarat and Maharashtra	3,600·00	..	..
Usarland Reclamation, Sheiladhar Institute	5,040·00	(+) 160·00	(a)
Azatobactor Inoculation of Crops, W. Bengal	..	..	..
Intake of different forms of Phosphate by Green Manuring Crops, Madras	7,000·00	(+) 500·00	(a)
Reclamation of Saline and Alkaline lands, M.P.	16,000·00	..	..
Standardization of methods for determining (a) Surface area and (b) P. M. Value of Soil Punjab Uty.	4,000·00	..	..
AGRONOMY			
Investigation into the method of Practices of Farming, Rajasthan ..	..	..	..
–do– H.P. ..	..	..	..
–do– M.P. ..	..	..	..
–do– Kerala ..	740·00	(+) 60·00	(a)
Lay Farming, U.P.	3,300·00	..	..

APPENDIX

1	2	3	4	5
			2,680	..
			3,340	..
			480	300
			13,000	..
			..	2,400
			6,640	..
			8,700	..
			1,400	1,000
			3,480	5,600
			800	4,000
			6,540	8,600
			15,300	5,000
			480	10,000
			450	..
			300	..
			450	..
			450	..
			4,900	15,000
			7,300	..
			1,940	800
			15,090	..
			500	..

15—Contd.

6	7	8	9
Study of Frequency of Irrigation and relative Efficiency of the Three methods of irrigation, viz., Flood, Furrow and overhead Sprinkler Irrigation, College of Agri., Rajasthan ..	..	..	..
Investigation into the Possibility of Using Sprinkler Irrigation System for Agri. purposes in the sandy coastal tract, A.P.	..	..	..
Green Manuring Scheme, Bihar ..	201·22	(+) 98·78	(a)
–do– C.R.R.I., Orissa	..	..	..
–do– M.P. ..	2,400·00	..	..
–do– I.C.J.C., Calcutta	..	..	..
–do– H.P. ..	..	..	..
–do– A.P. ..	1,000·00	..	..
–do– Mysore ..	5,600·00	..	..
–do– U.P. ..	4,000·00	..	..
Relation between moisture contents and fertility level and selected cropping scheme, Allahabad Agri. Institute	8,542·00	(+) 58·00	(a)
Research on Placement of Fertilizers for Jowar, Groundnut, Cotton, etc., Dharwar (Mysore)	5,000·00	..	..
Agronomic Research on Black Soils Region of South India, Madras ..	10,000·00	..	..
Study of Comparative merits of hyperphosphate and bonemeals against rock phosphate fertilizers, Kerala ..	..	..	(a) Inconsiderable
–do– Assam ..	..	..	..
–do– Mysore ..	..	..	..
–do– W. Bengal ..	..	..	..
Green Manuring, Khalsa College, Amritsar	14,700·00	(+) 300·00	(a)
Study of Efficient use of Water under different Irrigation Practices, Madras	..	..	..
Survey Study of Farm Structure, Madras	800·00	..	..
Study of filter point tubewells, A.P.	..	..	..
Water Requirements of Crops at C.F.R.S., Poona	..	..	..

APPENDIX

1	2	3	4	5
			2,000	100
			5,000	7,200
			6,880	..
			3,400	2,000
			9,400	4,000
			10,520	4,000
			1,700	2,400
			12,300	..
			3,580	..
			3,000	..
			10	..
			20,000	..
			1,400	1,600
			4,000	..
			1,750	..
			3,000	6,000
			9,060	..
			3,360	..

15—Contd.

6	7	8	9
Agronomic Aspects of Jowar, Amravati	100·00	..	..
Agronomical Investigations of Fodder Crops, B.R. College, Agra, U.P. ..	7,120·00	(+) 80·00	(a)
Project for investigation and mapping the water budget of India and vicinity and its use in irrigation and flood control, M.J. College, Jalgaon	..	..	..
Physiological Studies on water Relation of Crop Plants, Calcutta Uty.	2,000·00	..	..
Agronomic Aspects of Green Manuring, Maharashtra	4,000·00	..	..
Water Requirements of Crops, D.V.C.	4,000·00	..	..
PHYSIOLOGY			
Physiological effect of light, etc., on isolated tissues of some tropical crops, Calcutta University	2,390·00	(+) 10·00	(a)
Physiology of lodging habit in relation to metabolism of auxin action of rice, Calcutta University	..	..	..
Drought Resistance in Crop Plant, Madras	..	..	..
Rice Physiology, Calcutta University ..	..	..	..
Chemical stimulation of ovules, Delhi University	..	..	..
Plant Physiology and Plant introduction, Vivekanand Lab., U.P.	..	..	..
Morphological, ecological and physiological studies and algae from usarlands, Lucknow University ..	1,600·00	..	..
ENTOMOLOGY			
Intensification of Termite Research, Anand	..	..	..
Investigating the use of distress calls of birds feeding on grain crops, Bombay	..	..	...
Nutritional and Biological Studies on Insects, I.A.R.I.	6,000·00	..	..
Systematic and Biological Studies on Ardent Fauna, Delhi University ..	...	..	..
Augmenting the warmed insect collection, Agri. College, Coimbatore ..	..	..	(a) Inconsiderable

APPENDIX

1	2	3	4	5
			2,200	..
			8,500	..
			9,340	4,000
			2,460	5,100
			4,190	6,200
			10,900	7,600
			12,720	7,000
			10,900	3,400
			10,900	9,000
			3,850	1,500
			1,880	..
			3,100	2,000
			4,000	..
			..	6,900
			1,880	3,000
			170	..
			1,880	..
			..	5,800
			4,800	3,100
			8,530	5,000

15—Contd.

6	7	8	9
Research on Cytogenetics and taxonomy of the genes Arteoesia, Punjab ..	..	..	..
Disease of Cumin and fennel seed, Instt. of Agriculture, Anand ..	..	..	..
Biological Control of Sanjose Scale, J. & K.	4,000·00	..	..
Physiological relationship between insect and their host plants, Delhi University	5,100·00	..	..
Survey of Beneficial Coccinallids and investigations into their utilisation in the control of aphid, Coccids & mites pests of crops, Mysore	6,123·55	(+) 76·45	(a)
Co-ordinated Research Scheme on the Study of Field rats, Madras ..	7,600·00	..	..
–do– Punjab ..	7,000·00	..	..
–do– U.P. ..	3,400·00	..	..
–do– A.P. ..	9,000·00	..	..
Scheme for Investigation on Forage Insects, Rajasthan	1,500·00	..	..
Biology and Control of 'Aphid' under Dr. A. S. Srivastava, Government Entomologist, U.P.	..	..	..
Biology and Control of 'White flies' under Dr. M. Q. Khan, Government Entomologist, M.P.	2,000·00	..	..
Research on some South Indian mites of economic importance & their control, Madras	..	..	..
Research on fungicide, Western Region Poona, Maharashtra ..	6,900·00	..	..
Biological Control of mites under Shri Joshi, Punjab Government ..	3,000·00	..	..
Biology and Control of 'aphids' under Dr. C. L. Arora, Pb. University ..	..	..	..
Biology and Control of white flies under Dr. K. N. Trehan, Punjab. Uty. ..	..	..	..
Scheme on Chalcid Parasite of Coccids, Muslim University, Aligarh ..	5,770·00	(+) 30·00	(a)
Termite Research, F.R.I. ..	3,100·00	..	..
Scheme for control of Caterpillar of Cardamom, Mysore	5,000·00	..	..

APPENDIX

1	2	3	4	5
			..	5,000
			29,760	5,800
			8,160	1,900
			31,010	13,800
			12,280	..
			14,010	5,000
			13,300	5,000
			3,670	14,000
			30,000	2,800
			14,500	9,500
			4,560	4,000
			5,040	4,000
			5,000	3,200
			2,000	..
			3,100	2,000
			1,600	..
			2,680	..
			44,140	..
			16,830	..
			18,560	..

15—Contd.

6	7	8	9
Morphology and biology of common Paddy Cutworm, Aligarh ..	5,000·00	..	..
Termite and Research Scheme (Taxonomy) Zoological Survey of India, Calcutta	5,800·00	..	..
Study of the rate of decomposition of insecticides deposits, Osmania University, Hyderabad	1,890·00	(+) 10·00	(a)
Research on Fungicides, I.A.R.I. ..	13,800·00	..	(a) Inconsiderable
–do– Punjab	..	..	..
–do– Coimbatore (Madras)	4,800·00	(+) 200·00	(a)
–do– West Bengal ..	5,000·00	..	..
Exploration of Toxicity Hazards in the use of Modern Insecticides, I.A.R.I.	13,000·00	(+) 1,000·00	(a)
Exploration of Toxicity Hazards in the use of Modern Insecticides of Cattle, Human-beings, I.V.R.I. ..	2,800·00	..	..
Work on Bioessay and other techniques in the study of plant Diseases, Madras University	9,430·00	(+) 70·00	(a)
Research on Toxicity and Adverse Effect on Synthetic Pesticides, Madras	3,081·74	(+) 18·26	(a)
Control of Nematodes on Betelvine in Nasik Distt. Bombay	4,000·00	..	..
Termite Research, F.R.I. ..	5,200·00	..	..
–do– I.A.R.I. ..	..	..	..
Scheme for Fungicides, U.P. ..	2,000·00	..	..
Building up named reference collection of insect pests at the Agril. College, Baptala, Andhra	..	..	..
Fundamental Research on Toxicity and mode of action of Insecticides Punjab University College, Hoshiarpur ..	..	..	..
MYCOLOGY			
Virus Diseases, Poona	..	..	..
–do– Simla	..	..	..
–do– Delhi	..	..	..

APPENDIX

1	2	3	4	5
			6,580	..
			1,570	5,000
			8,240	8,000
			600	..
			6,500	9,600
			5,000	4,400
			1,300	..
			..	..
			4,100	3,700
			12,000	12,000
			9,050	..
			3,100	..
			6,700	..
			5,240	..
			1,000	..
			120	..
			20,450	27,000
			18,880	..
			4,950	..
			7,670	..
			2,500	2,000
			..	1,900
			6,320	6,000

15—Contd.

6	7	8	9
Co-ordinated Scheme for Control of Katee Diseases of Cardamom, Bombay	..	..	..
Control of Pan Diseases, M.P. ..	5,000·00	..	..
Zira Disease, Rajasthan	8,000·00	..	..
Ergot Production, Assam ..	13·84	(—) 13·84	(a)
–do– West Bengal ..	9,552·98	(+) 42·02	(a)
Co-ordinated Scheme for Control of Katee Diseases of Cardamom, Kerala	4,400·00	..	..
–do– Mysore ..	..	..	..
–do– I.A.R.I. (T.A. only)	..	..	..
A monographic Study of the Aspergilli and Penicilli of India, Allahabad University.	3,630·00	(+) 70·00	(a)
Establishment of Betelvine Research Station, A.P.	12,000·00	..	..
Foorki Diseases of Cardamom West Bengal	..	..	..
Research on Pan, Madras ..	..	..	..
Development of Herbarium crypogamal orientals, I.A.R.I... ..	..	..	..
Co-ordinated Plant Virus Scheme Eastern Zone, I.A.R.I. ..	..	..	..
Control of Budha Parasite, B. R. College, Agra	..	..	..
Fungicidal Sprays, I.A.R.I. ..	..	..	..
FLORICULTURE			
Cytogenetical & Physiological Studies in relation to Floriculture, I.A.R.I.	27,000·00	..	..
Development of Floriculture, Sikkim	..	..	..
Co-ordinated scheme on Floriculture, Poona, Maharashtra	..	..	..
–do– Calcutta & Darjeeling	..	..	..
Co-ordinated Scheme on Floriculture, Andhra	..	..	..
–do– I.A.R.I. ..	1,900·00	..	..
–do– Mysore ..	6,000·00	..	..

APPENDIX

1	2	3	4	5
			25,080	..
			25,660	..
			22,070	10,000
			20,990	20,000
			22,070	10,000
			6,300	6,000
			2,700	..
			5,000	..
			..	3,000
			36,380	..
			1,850	..
			15,000	20,000
			790	..
			1,400	..

*Plus 50% expenditure of the following four Government of India Schemes debitable to Research Funds:

(i) Composite Research Station for Pepper, Cardamom & Cashewnut, Assam.
(ii) Establishment of Research Station for Pepper, Kerala.
(iii) –do– Cardamom, Kerala.
(iv) –do– –do– Mysore.

15—Contd.

6	7	8	9
Co-ordinated Scheme on Floriculture, Other Centres	..	..	..
Maintenance and Preparation of Seeds and Bulbs of Imported Ornamental Plants, Main Centre, Srinagar ..	..	..	..
–do– Sub-Centre, Simla ..	10,000·00	..	..
–do– Sub-Centre, Mussoorie	20,000·00	..	..
–do– Ootacamund ..	10,000·00	..	..
Floriculture, Assam	6,000·00	..	..
Investigations into problems of seed production of late Cauliflowers in Kulu Valley, Punjab ..	..	..	..
Investigation into Ideal Storage Conditions for seeds of Ornamental Plants, Madras	..	..	..
Ways and Means of Helping Outstanding Nurseries preserving their valuable collection of flowers (ex-gratia payments to deserving Nurseries) ..	3,000·00	..	..
GENERAL			(a) Inconsiderable
Introduction of Economic plants, I.A.R.I.	..	..	..
Studies of Genetics and Variability of Algae, I.A.R.I.	..	..	..
Pre-soaking Seed in Nutrient Salt, Indore	19,927·91	(+) 72·09	(a)
–do– Vivekananda Lab. Almora	..	..	..
Total ..	19,22,687·63 46,470·09*	..	..
Total Agriculture ..	19,69,157·69		
II. ANIMAL HUSBANDRY			
CATTLE BREEDING			
Improvement of Kangayam breed, Madras	..	..	..

APPENDIX

1	2	3	4	5
			25,000	..
			..	70
			15,700	35,000
			51,000	..
			30,000	..
			40,000	10,000
			15,000	16,600
			25,000	18,000
			..	5,100
			5,000	..
			3,200	..
			1,270	..
			43,000	..
			50,000	..
			25,000	15,000
			12,000	5,000
			10,000	..
			16,000	..
			40,000	..
			..	20,900

15—Contd.

6	7	8	9
Cattle improvement and insurance, Punjab	..	..	..
Pilot Key Village Scheme, U.P. ..	37·62	32·38	(a)
Comparative Study of Selective breeding of Red Purnea, Bihar	35,000·00	..	..
Selective breeding and grading up of cattle, West Bengal	..	..	..
Camel Farm for the Bikaneri breed and opening of ten Key Village Centres, Rajasthan	..	..	..
Evolution of new type of pig by cross breeding Sikkim	10,000·00	..	..
–do– U.P. ..	16,530·00	(+) 70·00	(a)
Relative value of selective breeding and grading up of Unbalachary cattle, Madras	18,000·00	..	..
Rearing on sex behaviour of breeding of bulls, Madras	5,100·00	..	..
Degeneration of Jamunapari goats when taken away from their home tracts, U.P.	..	..	..
Establishment of Northern artificial insemination Station at the I.A.R.I.	..	..	..
Physiology of hump development and sheath of cattle, Veterinary College Calcutta, Bengal	..	..	..
Physiological Genetics of Cattle, West Bengal	..	..	(a) Inconsiderable
Selective breeding and grading up of indigenous cattle, Orissa ..	..	..	..
Cattle Breeding Research, H.P. ..	15,000·00	..	..
Production of Sterlity in Lab. Animals, C.D.R.I.	5,000·00	..	..
Reproduction Studies in Kankrej Cows and Sindhi Buffaloes, Anand ..	..	..	..
Artificial Insemination, I.D.R.I. ..	..	..	..
Progeny Testing of Murrah Buffaloes, Bulls, Bombay	..	..	..
Central Artificial Insemination Substation, Calcutta	20,860·00	(+) 40·00	(a)

APPENDIX

1	2	3	4	5
			15,000	14,000
			5,000	23,500
			4,000	..
			9,000	6,100
			25,000	..
			11,000	10,000
			8,220	9,000
			11,000	3,300
			10,000	9,000
			10,000	10,700
			10,000	9,000
			6,000	8,000
			11,300	14,000
			4,000	..
			6,000	11,700
			7,700	7,500
			25,000	..
			20,000	..
			18,000	..
			22,690	..

5—Contd.

6	7	8	9
Cross breeding of local non-descript cattle, Andhra	14,000·00	..	..
Cross breeding of cattle in heavy rainfall areas (Neyyatmkara Centre), Kerala	23,500·00	..	..
Scheme for investigation of the possibility of spreading out the breeding season in Buffaloes, I.V.R.I. ..	6,052·25	(+) 47·75	(a) Inconsiderable
Cross Breeding of Cattle in hilly and heavy rainfall areas, Mysore ..	6,070·00	(+) 30·00	(a)
Scheme for Investigating the Comparative Value of Grading up with Sindhi Bulls and Cross Breeding with Jersey Bulls for Increased Milk Production, Kerala	..	..	..
GOAT AND SHEEP BREEDING			
Development of mutton breeds of sheep, Maharashtra	10,000·00	..	..
–do– Chingleput, Madras	9,000·00	..	..
Sheep Research Station, Punjab ..	3,300·00	..	..
Meat and Mahir goat, Bombay ..	9,000·00	..	..
Establishment of research units of sheep production in mixed farming, Madras	10,700·00	..	..
Angora Goat Breeding, U.P. ..	9,000·00	..	..
Improvement of Sheep in Hills, West Bengal	8,000·00	..	..
Improvement of Goat, West Bengal ..	14,000·00	..	..
Exploring the possibilities of Mohair Production, Andhra	..	..	..
Development of mutton breeds of sheep, Andhra	11,700·00	..	..
Establishment of research units for study of sheep production in mixed farming economy, Punjab	7,500·00	..	..
Sheep and Wool improvement on regional basis, U.P.	..	..	..
–do– Bombay (Joria Centre) ..	..	..	..
–do– Bihar ..	..	..	..
–do– Madras (Revised)	..	..	..

APPENDIX

1	2	3	4	5
			8,000	4,000
			6,200	..
			15,000	..
			75,000	..
			12,020	..
			40,000	..
			5,000	..
			30,000	..
			6,000	3,000
			12,000	..
			4,660	..
			5,070	..
			20,140	..
			16,650	..
			65,350	30,000
			1,540	..
			11,000	3,000
			7,180	6,000
			6,000	2,000
			6,800	..
			3,700	..
			4,500	..
			5,500	..

15—Contd.

6	7	8	9
Developing strains of goats for Mohair production, Himachal Pradesh ..	4,000·00	..	..
Development of mutton breeds of sheep, Mysore	..	..	..
Sheep and Wool Improvement on regional basis, Rajasthan ..	..	..	..
–do– H.P.	..	..	..
–do– Jammu & Kashmir (old) ..	..	..	..
–do– –do– (Revised)	..	..	..
–do– Mysore	..	..	..
–do– Bombay (Poona) ..	..	..	..
Developing strains of goats for milk production, Kerala	3,000·00	..	..
ANIMAL NUTRITION			(a) Inconsiderable
Animal Nutrition, Punjab ..	..	..	..
–do– Gujarat ..	..	..	..
–do– N.D.R.I. ..	..	..	..
–do– West Bengal ..	..	..	..
Urea as a protein substitute, I.V.R.I. ..	..	..	..
Nutrition requirements of Buffaloes, Agra	30,422·00	(—) 422·00	(a)
Scheme for Conducting experiments on the Economics of Poultry Ration, Madras	..	..	..
–do– Punjab ..	3,000·00	..	..
–do– U.P. ..	6,000·00	..	..
–do– Mysore ..	2,000·00	..	..
Popularising ready to feed balanced poultry feed mixtures, Bihar ..	..	..	..
Economic feed mixtures for middle white Yorkshire Pigs, M.P. ..	..	..	..
Evolving economic Poultry Ration, Maharashtra	..	..	..
Systematic Study of Poultry Nutrition, Punjab	..	..	..

APPENDIX

1	2	3	4	5
			4,500	4,000
			12,000	..
			4,500	5,500
			5,000	..
			32,760	..
			6,000	..
			7,000	..
			10,650	3,000
			3,180	900
			15,000	19,500
			25,000	25,000
			5,000	..
			15,000	..
			6,300	7,000
			..	74,600
			8,500	11,000

15—Contd.

6	7	8	9
Scheme on Economics of Poultry Rations, M.P.	4,000·00	..	..
Comparative efficiency of Cows and Buffaloes in Milk Production at different levels of Nutritions, Anand ..	..	..	..
Study of Chemical Constituents and Haematological aspects of different breeds, Mysore	5,500·00	..	..
Scheme for enquiry on the quantitative and qualitative differences in the nutritional requirements of animals in west coast, Kerala ..	..	..	..
Studies on the effect of feeding economic balanced common mixtures as against cotton seeds or cotton seed cakes above buffaloes, Anand	..	..	..
To find out cheap poultry ration and its effect on growth rate, egg production etc., Bihar	..	..	..
Pilot Scheme for popularizing ready-to-feed balanced poultry feed, Delhi Cantt.	..	..	..
Studies on food requirements of sheep under range and agricultural conditions, I.V.R.I.	2,923·24	(+) 76·76	(a)
Co-ordinating Officer Animal Nutrition, I.V.R.I.	870·00	(+) 30·00	(a)
Scheme on the investigation on the nutritional requirements of pigs, I.V.R.I.	19,439·50	(+) 60·50	(a)
Investigation on the quality of wool and meat in relation to nutrition of sheep, B. R. College, Agra	25,072·00	(—) 72·00	(a)
ANIMAL PESTS AND DISEASES AND CURE			
Veterinary investigation Officer (Cattle) Saurashtra and Kutch ..	..	..	(a) Inconsiderable
–do– Rajasthan ..	..	..	..
Assistant Disease Investigation Officer (Sheep and Goat), Rajasthan ..	6,942·00	(+) 58·00	(a)
Investigating the possibilities of large scale manufacture of H.S. Adjutant Vaccine, I.V.R.I.	74,558·00	(+) 42·00	(a)
Biological control of Fascioliasis introduction of ducks, A.P. ..	11,000·00	..	..

APPENDIX

1	2	3	4	5
			3,500	5,000
			6,000	..
			8,000	10,000
			6,000	..
			4,000	6,700
			5,040	4,300
			2,800	5,300
			5,000	4,600
			5,000	5,000
			3,000	..
			3,500	2,400
			3,000	2,500
			10,000	20,500
			..	3,400
			2,560	8,990
			..	6,300
			7,860	7,300
			21,700	15,000
			4,000	..
			8,000	4,400
			3,500	2,500
			10,000	8,000

15—Contd.

6	7	8	9
V.I.O. (Sheep and Goats) J & K ..	5,000·00	..	..
Control of Liver Fluke Infection, Jammu and Kashmir ..	..	..	..
–do– H.P. ..	10,000·00	..	..
Control and eradication of Equizootic Lymphangitis amongst equidae, D.A.R.V.F., I.V.R.I.	..	..	..
Provision of technical and clerical staff to the Coordinating Officer (Humpsore Scheme), I.V.R.I. ..	6,670·00	(+) 30·00	(a)
A.D.I.O. Pigs, Punjab	4,300·00	..	..
–do– Andhra	5,280·00	(+) 20·00	(a)
Asstt. Disease Investigation Officer (Camels) Punjab	4,600·00	..	..
Bacteriological flora of bovine genetalia, Orissa	5,000·00	..	..
Use of indigenous drugs in Vety. Practices, I.V.R.I.	..	..	..
Investigation of Bovine Lymphangitis, Mysore	2,360·00	(+) 40·00	(a)
Survey and Investigation into Disease of Ducks, A.P.	2,450·00	(+) 50·00	(a)
Control of Brucellosis, Madras ..	20,500·00	..	..
Investigations into infectious Coryza and allied conditions in Poultry, I.V.R.I.	3,350·00	(+) 50·00	(a)
Rabbies Research and Diagnostic Centre, I.V.R.I.	8,970·00	(+) 20·00	(a)
Parasitic Disease, Mysore ..	6,238·37	(+) 31·63	(a)
Fluke disease of bovine, Mysore ..	7,300·00	..	..
Investigation of infectious abortion (Brucellosis) U.P.	15,000·00	..	..
Liver Fluke and other parasitic infection of live-stock, Bihar ..	..	..	..
Control and eradication of stephonofil arising among cattle, Humpsore Scheme, Orissa	4,333·78	(+) 66·22	(a)
–do– Assam ..	2,500·00	..	..
–do– West Bengal ..	8,000·00	..	..

APPENDIX

1	2	3	4	5
			9,000	..
			5,000	5,500
			6,570	..
			5,000	..
			33,000	26,000
			5,000	5,000
			6,000	6,500
			4,100	4,000
			6,700	10,000
			5,370	2,000
			2,560	..
			2,600	3,000
			3,660	..
			3,760	..
			5,820	2,500
			6,440	..
			3,630	..
			4,000	..
			12,000	..
			..	3,000

15—Contd.

6	7	8	9
Studies on micotic disease in domestic animals in India, West Bengal ..	..	..	..
Investigation of Bovine Paraplegia and Paralysis, Mysore	5,484·35	(+) 15·65	(a)
Bearing of nutrition on helminthic infection, I.V.R.I.	..	..	..
Coccidal fauna of cattle, Maharashtra...	..	..	..
Control of bovine Pleuro-Pneumonia, Assam	26,066·00	(+) 66·00	..
Elucidation of life-history of :			
(i) Parafilaria bovicola			
(ii) Stariacorvi and			
(iii) Setariadigtata including studies on their pathologicity, Bihar	5,000·00	..	..
Investigation of Brucellosis, Bihar ..	6,500·00	..	..
Experimental studies on Bovines Anaesthasia under Indian conditions, Orissa	4,000·00	..	..
Disease investigation, H.P. ..	10,000·00	..	..
Survey of Acarina Disease, Punjab ..	1,430·00	(+) 570·00	(a)
Investigation of Bovine Trichomoniasis	..	..	..
Control of warble infestation in cattle, Punjab	2,980·00	(+) 20·00	(a)
Investigation to observe gastro-entritis among cattle, Mysore	..	..	..
Pastular Dermatitis in Sheep and Goats, Bihar	..	..	..
Development of an improved vaccine for Anthrax, Madras ..	2,600·00	..	..
Investigation on Yellow Disease of cattle, Bihar	..	..	..
Study of the endocrinological factors in Horn cancer, U.P.	..	..	..
Investigation of Mastitis, Maharashtra	..	..	..
–do– I.V.R.I. ..	..	..	..
–do– U.P. ..	3,000·00	..	..

APPENDIX

1	2	3	4	5
			..	..
			..	9,700
			8,100	..
			7,800	..
			800	2,000
			13,000	7,000
			2,450	4,000
			9,600	..
			15,000	14,700
			..	15,000
			8,000	..
			15,000	540
			10,000	..
			8,000	..
			6,000	7,500
			12,000	7,900
			1,900	3,100

15—Contd.

6	7	8	9
DAIRYING			
Rapid determination of fats etc. of milk, Punjab	2·00	(—) 2·00	(a)
Bacteriological quality of Milk, Kaira, Gujarat	9,655·21	(+) 44·79	(a)
Survey of bacteriological quality of Milk, Orissa	..	..	..
–do– Bihar ..	..	..	..
Provision of clerical assistance to the Co-ordinating Officer of the scheme for bacteriological quality of milk, N.D.R.I.	2,000·00	..	..
Accelerated oxidation test of ghee N.D.R.I.	7,000·00	..	..
Detection of adulteration and estimation of main constituents of milk, Panjab University	4,000·00	..	..
Study on the economics of specialised dairy farming under various conditions in Patiala (Punjab) ..	..	..	..
Survey of bacteriological quality of milk supply to Haringhatta Centre, W. Bengal	14,650·00	(+) 50·00	..
Survey of bacteriological quality of milk in Trivandrum, Kerala ..	15,000·00	..	..
Manufacture of bovine cured Edam Cheese (ball type) and golden Cheese (small flat leaf) from standardised buffalo milk, Maharashtra ..	..	..	..
Survey of Bacteriological quality of milk, Agricultural Institute, Allahabad ..	548·00	(—) 8·00	(a)
Study of sterilization of cream and flavoured milk, Aarey Colony, Bombay	..	..	..
Survey of bacteriological quality of milk supply in Jaipur, Rajasthan ..	..	..	..
Sanitization of dairy utensils under rural conditions and in organized Dairies in Allahabad City and in Allahabad District, Allahabad Agricultural Institute	7,452·00	(+) 48·00	(a)
Trial on graded wool, Rajasthan ..	7,900·00	..	..
Estt. Utilization of wool Centre, Madras	3,100·00	..	..

APPENDIX

1	2	3	4	5
			15,000	..
			..	100
			5,000	3,300
			3,300	2,800
			6,070	100
			5,000	1,500
			6,000	..
			..	1,200
			3,200	6,000
			2,500	3,600
			8,000	..
			20,300	21,000
			3,100	..
			3,200	1,400
			80,000	200
			6,800	2,100
			70,000	84,000
			..	1,300
			2,000	310
			5,000	5,300
			3,000	4,000

15—Contd.

6	7	8	9
Incidence of yellow colour in wool produced in northern plains, Rajasthan	..	..	..
Manufacture of fat liquors, C.L.R.I.	120·00	(—) 20·00	(a)
Skin studies of sheep (Co-ordinated scheme) Bombay	3,300·00	..	..
Improvement of leather-making quality of raw hides and skins from dead animals—C.L.R.I.	2,800·00	..	..
Skin studies of sheep (Co-ordinated Scheme) U.P.	27·00	(+) 73·00	(a)
–do– Rajasthan ..	1,500	..	..
POULTRY			
Coccidiosis in Poultry, I.V.R.I. ..	5·00	(—) 5·00	(a)
Poultry Research, Kerala ..	1,154·06	(+) 45·94	(a)
Increased duck production in the Bet areas, Punjab	6,000·00	..	..
Determination of the ideal Conditions for the Commercial Storage of eggs, Punjab	3,600·00	..	..
Popularising the rearing of baby Chicks, I.V.R.I.	..	..	(a) Inconsiderable
Pilot Project in day-old chick Industry; Katpadi, Madras	20,914·00	(+) 86·00	(a)
Asil Breed of Poultry, Maharashtra ..	..	..	..
–do– Madras ..	1,400·00	..	..
Poultry development, American Mission, Madras	138·00	(+) 62·00	(a)
Keeping Poultry in battery, W. Bengal	2,080·00	(+) 20·00	(a)
Rearing of white Leghorn Chicken, Y.M.C.A., Martandam ..	83,939·00	(+) 11·00	(a)
Defertilization of eggs, I.V.R.I. ..	1,261·00	(+) 39·00	(a)
Investigation of possibilities of correlation between Physiological and body characteristics of egg production, I.V.R.I.	322·00	(—) 12·00	(a)
To produce proven cocks for poultry improvement, Madras	5,280·00	(+) 20·00	..
Selective Breeding of Asil breed of poultry, Andhra Pradesh ..	4,000·00	..	..

APPENDIX

1	2	3	4	5
			23,000	15,300
			10,000	..
			1,400	..
			1,660	..
			2,200	2,000
			4,000	2,800
			3,770	3,000
			5,000	52,100
			8,000	4,190
			6,000	5,700
			3,000	6,500
			4,440	5,000
			4,970	..
			6,000	9,000
			..	2,000
			3,840	3,500
			4,480	5,200
			3,600	5,500
			18,000	40,000
			10,000	..
			12,000	12,000

15—Contd.

6	7	8	9
Formation of hybrids from early tested inbreds of White Leghorn and Rhode Island Red, Uttar Pradesh ..	15,229·33	(+) 70·67	(a)
Comparing performance of different Strains of Poultry by applying random Sample Tests, I.V.R.I. ..	..	..	..
Cheap Poultry House, Madras ..	..	..	..
–do– Bihar ..	..	..	..
–do– Orissa ..	2,000·00	..	..
–do– U.P. ..	2,728·60	(+) 71·40	(a)
–do– M.P. ..	3,000·00	..	..
Investigating the advantages of broiler production in large Unit, Hyderabad	52,013·38	(+) 86·62	(a)
Scheme for investigating the advantages of producingPoultry in large Unit, Nagpur, Maharashtra	4,194·00	(—) 4·00	(a)
Duck Breeding, Kerala ..	5,625·08	(+) 74·92	(a)
–do– I.V.R.I. ..	6,427·00	(+) 73·00	..
Cheap and durable Poultry House, Andhra Pradesh, ...	5,000·00	..	..
FISH			
Study of Microbial flora fresh water fish from Bay of Bengal, W. Bengal ..	..	..	..
Farming of fresh water Prawns in Confined water, Andhra Pradesh ..	9,000·00	..	..
Preparation of Peptone from fish, Andhra Pradesh	2,000·00	..	..
Improved method of fish Preservation, Andhra Pradesh	3,500·00	..	..
Brackish water fish culture, Madras	5,200·00	..	..
Improvement of the method of transport and short time preservation of fresh water fish, West Bengal ..	5,500·00	..	(a) Inconsiderable
Hydro-biological and Faunistic Survey of the Godavari Estuarine system, Andhra University	40,000·00	..	..
Ecology of fresh water fish in U.P. Lucknow University.	..	..	..
Research in Paddy-cum-pisciculture in Krishna District, Andhra ..	12,000·00	..	..

APPENDIX

1	2	3	4	5
			6,700	5,000
			2,000	3,500
			11,000	12,000
			3,210	4,200
			1,67,600	62,000
			5,000	4,440
			400	..
			29,000	10,000
			..	3,700
			7,410	..
			5,300	..
			4,400	..
			3,440	..
			500	..
			81,380	1,30,400
			4,000	..
			4,000	4,000
			4,640	..
			3,970	4,500

15—Contd.

6	7	8	9
Investigation on traps-cum-culture, M.P.	5,000·00	..	..
Investigation into the loss of freshness in fish stored in ice, Jadavpur University, West Bengal	3,500·00	..	..
APICULTURE			
Northern Region Chamba, Himachal Pradesh	12,000·00	..	..
Improving honey yield of beehives, A.P.	4,200·00	..	..
MISCELLANEOUS			
Award of fellowships in A.H. Subject, at various centres	61,694·22	(+) 305·78	(a)
Diploma Course in Swine Husbandry and Pork processing at Central Dairy Farm, Aligarh, Uttar Pradesh ..	4,350·00	(+) 90·00	(a)
(iii) COMBINED AGRICULTURE AND ANIMAL HUSBANDRY SCHEMES			
DEVELOPMENT			
Improved axles and hubs, I.A.R.I. ..	..	..	..
Improved bullock-drawn Agril. Implements B. R. College, Agra ..	10,000·00	..	..
Refresher Course in Agri. for young farmers, M.P.	3,618·78	(+) 81·22	(a)
–do– Hyderabad ..	..	..	..
Survey of indigenous Implements, I.A.R.I.	..	..	..
–do– Mysore ..	..	..	..
–do– Rajasthan ..	..	..	..
–do– V.P. ..	..	..	..
Research fellowship for post-graduate training in Agril. subjects. ..	1,31,442·54	(—)1,042·54	(a)
Survey of Additional Indigenous Agril. Implements All States, Jammu and Kashmir	..	..	..
–do– Kerala ..	4,000·00	..	..
–do– Orissa ..	..	..	..
–do– Bihar ..	4,500·00	..	..

APPENDIX

1	2	3	4	5
			2,480	..
			..	3,000
			810	..
			3,640	..
			3,670	6,000
			4,210	..
			3,480	..
			4,610	..
			3,780	..
			33,140	..
			20	..
			50	..
			3,530	..
			3,530	..
			3,530	..
			3,530	..
			3,530	..
			3,530	..
			3,530	..
			3,530	..
			3,530	..
			3,530	1,900
			3,530	..
			3,530	..
			3,530	..
			27,000	50,000

15—Contd.

6		7	8	9
–do–	Andhra ..	..	..	..
–do–	Madras ..	3,000·00	..	..
–do–	U.P. ..	..	..	..
–do–	Punjab ..	..	..	..
–do–	Maharashtra ..	6,000·00	..	..
Survey of Addl. Indigenous Agril. Implements, Assam		..	..	..
–do–	M.P. ..	..	..	..
–do–	West Bengal ..	..	..	..
–do–	Mysore ..	..	..	..
–do–	I.A.R.I. ..	..	..	..
Survey of fertilizer practices in Meerut Distt. U.P.		..	..	..
–do–	Kerala ..	..	..	..
–do–	Orissa ..	..	..	..
–do–	Bihar ..	..	..	..
–do–	Punjab ..	..	..	..
–do–	Madras ..	..	..	..
–do–	M.P. ..	..	..	..
Scheme for the trial of imported agricultural implements, Rajasthan ..		..	..	..
–do–	U.P. ..	..	..	(a) Inconsiderable
–do–	Mysore ..	..	..	..
–do–	Maharashtra ..	..	..	..
–do–	Kerala ..	1,833·77	(+) 66·23	(a)
–do–	Assam ..	..	..	..
–do–	Andhra ..	..	..	..
–do–	J and K ..	..	..	..
STATISTICAL & MISC. SCHEMES				
Scheme for studying the intensive cultural practices in small holding, Calcutta University		50,000	..	..

APPENDIX

1	2	3	4	5
			25,000	8,000
			2,040	..
			--	2,000
			5,330	30,000
			29,600	17,000
			12,000	18,000
			38,000	..
			6,000	..
			--	100
			23,000	..
			25,000	..
			55,540	--
			5,000	..
			12,730	10,000
			21,340	..
			..	..
			18,850	..
			15,000	13,000

15—Contd.

6	7	8	9
Pilot sample investigation practices and yield of orange crops, Bombay	8,000	..	..
Pilot sample investigation on the cultivation practices and yield in Mango crops, U.P.	..	..	..
Advantage and economics of mechanised farming, Madras	2,000	..	..
Pilot Scheme for study of cultivation practices and yield of guava crops in Allahabad, U.P.	30,000	..	..
–do– Banana crop Kerala	17,000	..	..
–do– Lime crop A.P. ..	18,056·55	(—) 56·55	(a)
Survey to work out the cost of production of sheep and wool, Rajasthan..	..	..	..
Study of Economics of Bunding, Bombay	..	..	..
Survey of Fertilizer Factories, M.P. ..	53·77	(+) 46·23	..
Scheme for study of economic conditions of Ghata Prabha left Bank Canal Area, Mysore	..	..	..
Study of production and consumption Aspect of Agril. families in different class structure at Anand (Gujarat) ..	..	..	..
Pilot Scheme for study of incidence of pests and disease of rice, Orissa	..	..	(a) Inconsiderable
Investigating the cost of production of sheep and wool, Andhra Pradesh ..	..	..	..
Operational research for studying the extent to which improved agril. practices are being adopted and their economics—Madras	10,000	..	..
Conduct of pilot surveys for evaluation of various improved agril. practices, U.P.	..	..	..
Studies in the behaviour of consumption and marketing, Gokhale Instt. of Politics and Economics—Poona ..	27·90	(—) 27·90	(a)
Sample Survey to determine effect of mechanization of fishing craft, Maharashtra	..	..	(a)
Pilot scheme for study of cultivation of fruits and vegetable crops I.C.A.R.	13,230·83	(—) 230·83	(a)

APPENDIX

1	2	3	4	5
			2,500	..
			15,970	5,000
			54,930	20,000
			24,280	..
			15,940	10,000
			20,000	..
			10,000	..
			1,940	..
			2,580	800
			16,600	..
			10,000	10,000
			4,870	8,000
			19,150	..
			40,000	37,500
			30,000	48,500
			8,00,000	1,01,600

15—Contd.

6	7	8	9
Studies on the livestock economics in Key Village Blocks, Maharashtra	..	..	..
Appraisal of overall benefits of improvement in Farming and possibilities of budgeting, Bihar ..	5,000·00	..	..
Enquiry into the effects of lift irrigation, Osmania University ..	19,200·00	(+) 800·00	(a)
Enquiry into the cost of production of vegetables, Punjab	..	..	..
Enquiry into economics of irrigation in Coimbatore Distt., Madras ..	10,000·00	..	..
Scheme for enquiry into factors influencing cropping pattern on individual holdings, B.R. College, Agra	..	..	..
–do– Andhra Pradesh	..	..	..
Survey and study of farm structures, Coimbatore, Madras ..	..	..	..
Statistical study of the variations in yield of paddy, cotton, etc. Madras	750·00	(+) 50·00	..
Scheme for enquiry into factors influencing cropping pattern on individual holdings, Bhubaneswar, Orissa	10,000·00	..	..
–do– Bihar ..	10,000·00	..	..
–do– Punjab ..	8,000·00	..	..
Investigation on the adoption of improved practices and the capital invested on different types and sizes of farms, Dharwar, Mysore ..	..	..	(a)
CONTRIBUTION			
Commonwealth Agricultural Bureaux Imperial Institute. Conference of Entomology, Farnham House Laboratory. Imperial Bureaux of Dairy Science Fruit Preservation Research Station Campden	37,550·00	(—) 50·00	(a)
Debts and Remittances			
Loans and Advances	48,454·22	(+) 45·78	(d) Payment of outstanding bills could not be made during the year.
Deposits and Advances repayable ..	1,01,250·13	(+) 249·87	(a)

APPENDIX

1	2	3	4	5
			60,000	72,000
			4,900	..
			2,700	..
			7,000	..
			5,000	..
			4,000	..
			25,000	..
			3,000	..
			2,000	..
			10,000	..
			11,620	..
			8,000	5,300
			..	300
			5,470	..
			8,890	..

15—Contd.

6	7	8	9
Payment of income-tax Provident fund etc.	24,635·95	47,364·05	(a)
CAPITAL			
Grants-in-Aid			
Establishment of Horticulture Plant Introduction Station, Saharanpur (U.P.)	..	..	(a) Inconsiderable
Coordinated Scheme for the study of the application of growth-regulating substance in horticulture Kerala ..	..	..	..
Improvement of Vegetable, Sikkim ..	..	..	
Maintenance and preparation of seeds and bulbs of imported ornamental plants. Main Centre—Srinagar ..	..	..	..
Co-ordinated scheme on floriculture with Centres at Calcutta and Darjeeling, W. Bengal	..	..	..
Ways and means of helping outstanding nurseries for preserving their valuable collection of flowers, Sikkim ..	..	..	..
Investigation into ideal storage conditions for seeds of ornamental plants, Madras	..	..	..
Diseases of Cumin and fennel seeds. Institute of Agri., Anand ..	..	..	..
Composition of Plants in Usarlands Lucknow University.	..	..	..
Building of the I.C.A.R. Statistical Wing	..	..	..
GOVERNMENT GRANTS			
Grants-in-aid Schemes financed from Government Grants			
(i) AGRICULTURE			
Weed Control—B. R. College, Agra ..	5,300·00	..	..
Indian Central Spices and Cashewnut Committee, Ernakulam (I.C.A.R.)	300·00	..	..
Simple Fertilizer Trial on Cultivators Field, I.A.R.I.	..	..	(a) (e) The expenditure is shared between G.O.I. & I.C.A.R.
–do– H.P. ..	..	..	

APPENDIX

1	2	3	4	5
			2,00,000	74,800
			21,200	44,300
			18,700	15,000
			18,700	11,300
			13,000	22,500
			3,000	..
			6,000	6,200
			15,00,000	65,000
			38,13,000	12,36,000
			..	2,14,700
			3,54,000	6,57,000
			50,000	6,500
			12,000	11,500
			1,00,600	1,48,000
			2,00,000	2,62,200
			10,200	12,700
			5,00,000	1,95,000
			1,30,000	45,000
			52,000	43,500
			1,37,000	61,200
			52,200	52,200

15—Contd.

6	7	8	9
Manurial Trials and Agronomic Experiments	74,580·38	(+) 219·62	(a)
Composite Research Station for Pepper, Cardamom and Cashewnut, Assam	44,300·00	(e)	..
Establishment of Research Station for Pepper, Kerala ..	15,000·00 (e)	..	..
–do– Cardamom, Kerala..	11,160·12 (e)	(+) 139·88	(a)
–do– Mysore	22,480·00 (e)	(+) 20·00	(a)
Development of Ginger, Kerala ..	..	..	..
Co-ordinated Wheat Rust Control Scheme, I.C.A.R.	6,216·63	(—) 16·63	(a)
Hybrid Maize Seed	64,760·11	(+) 239·89	(a)
PIRRCOM	12,53,598·29	(—) 17,598·29	(a)
Establishment of National Horotorium in States	2,14,700·00	..	..
Co-ordinated Maize Breeding Scheme	6,47,074·41	(+) 9,925·59	(a)
Grant of Financial Assistances to Agriculture—Horticultural Societies ..	6,500·00	..	..
(ii) Animal Husbandry			
Cattle Sterility	11,491·19	(+) 8·81	(a)
Cross Breeding of Cattle ..	1,47,419·72	(+) 580·28	(a)
Sheep and Wool Improvement on Regional Basis	2,61,912·75	(+) 287·25	(a)
Co-ordinated Scheme for study of Economics of Specialised Dairy Farming under Various Conditions	12,700·00	..	..
Establishment of Regional Animal Nutrition Centre	1,94,674·00	(+) 326·00	(a)
Selective Breeding and Grading up of Cattle	71,616·29	(—)26,616·29	(b) Excess demand received than anticipated
Comparative Value of Grading up with Sindhi and Cross Breeding with Jersey for increased Milk Production, Kerala	42,488·46	(+) 11·54	(a)
Central Artificial Insemination Centre, Bengalore	61,140·37	(+) 5,963	(a)
Camel Breeding, Rajasthan ..	52,200·00	..	..

APPENDIX

1	2	3	4	5
			..	8,400
			80,800	20,200
			22,500	20,000
			1,47,000	88,000
			1,10,000	90,000
			3,00,000	2,40,000
			..	23,000
			..	11,800
			50,000	31,200
			4,50,000	20,000
			80,000	17,700
			1,00,000	69,000
			1,00,000	1,00,000
			10,000	..
			..	40,000
			..	6,600
			70,000	48,000
			27,500	20,800
			..	75,000

15—Contd.

6	7	8	9
Study of Incidence of Pests on Rice, I.C.A.R.	8,375·97	(+) 24·03	(a)
Survey of Fertilizer Practices A.P. 4,000·00 U.P. 4,400·00 Madras 6,100·00 Orissa .. Mysore .. I.C.A.R. 5,699·96	20,199·96	(+) 0·04	(a)
Statistical Data on Yield and extent of Cashewnut Cultivation, Mysore ..	20,000·00	..	..
National Index of Field Experiments	85,524·56	(+) 475·44	(a)
Study of Milk Yield Breeds and Management Practices of Bovines ..	89·909·57	(+) 90·43	..
Production of Agricultural Films ..	2,39,631·84	(+) 368·16	(a) Inconsiderable
Intensive Agricultural District Programme	22,542·17	(+) 457·83	(a)
Pilot Survey and Study of cultivation practices of Pepper and their influence on yield, Kerala	11,807·87	(—) 7·87	(a)
Preparation of Propaganda Material for Rinderpest Eradication ..	31,172·00	(+) 28·00	(a)
Additional Facilities to be provided at I.A.R.S. (I.C.A.R.)	18,612·39	(+)1,387·61	(a)
Pilot Investigation for Collection of data on Cardamom	18,136·37	(+) 436·37	(a)
Pilot Scheme for Study of Poultry Practices, A.P., Kerala, W. Bengal I.C.A.R.	62,499·15	(+)6,500·85	..
Study of Feeding and Rearing Practices of Sheep and Wool	1,03,410·58	(+)3,410·58	(a)
Cattle Insurance Scheme ..	..	..	..
Study of Incidence of Pest and Diseases of Rice, Orissa	40,000·00	..	..
–do– Madras ..	6,570·00	(+) 30·00	(a)
Pilot Scheme for rearing Practices of Sheep and Wool, Mysore ..	48,000·00	..	..
Pilot Investigation of Statistical data on Yield and extent of Cashewnut Cultivation, Kerala	20,800·00	..	..
Scheme for estimating the cost of Milk Production, West Bengal ..	75,300·00	(—) 300·00	

APPENDIX

1	2	3	4	5
			10,000	28,500
			10,000	40,000
			1,00,000	33,000
			22,000	..
			16,93,000	..
			58,04.750	..
			..	1,44,400
			58,04,730	..
			..	..

15—Concluded

6	7	8	9
(a) Pilot Investigation of collection of Statistical data on yield of Cardamom cultivation, Mysore ..	28,500·00	..	..
(b) –do– Kerala ..	40,000·00	..	..
Cost of Milk Production in India ..	32,674·53	(+) 325·47	(a)
Local Cost of Foreign Expert ..	..	..	..
Total	42,45,279·68	..	..
Net Remitted to The Government of India	41,98,809·62	..	..
Refunded to The Government of India	1,03,176·96	(—)41,243·04	(a)
Grand Total ..	1,03,176·96		
Investments and Reinvestments ..	1,11,50,000·00		
Closing Balance	30,56,708·04		
(1) Cash in Hand	(—) 40·00		
(2) Bank Balance (General A/C Ledger) as on 31-3-62	28,94,605·96		
(3) Provident fund Balance ..	1,62,142·08		
TOTAL ..	30,56,708·04		

APPENDIX

INDIAN COUNCIL OF

STATEMENT OF RECEIPTS AND

Receipts and Opening Balance			Amount
			Rs. nP.
I. Opening Balance			22,71,196·10
II. Receipts under A.P.C. Act			52,03,754·87
III. Contribution and Grants			41,75,821·38
(a) From Central Government	41,11,904·00		—
(b) From Special Grants	63,917·38		—
IV. Interest from Investments			8,21,432·05
V. Miscellaneous Receipts			9,68,478·41
VI. Debts and Remittances			2,93,590·51
VII. Investments and Re-investments			1,07,61,400·00
	Grand Total ..		2,44,95,673·32
(1) Opening Balance	22,71,196·10		
(2) Receipts during the year	1,14,63,077·22		
(3) Investments and Re-investments	1,07,61,400·00		
Grand Total	2,44,95,673·32		
Particulars of Closing Balance			
1. Cash in Hand as per Cash Book as on 31-3-62			(—) 40·00
2. Bank Balance (General. A/c. Ledger) as on 31-3-62			28,94,605·96
3. Prov. Fund Balance			1,62,142·08
	Total ..		30,56,708·04

Checked and found correct subject to the remarks in the Inspection Report.

Sd/—H. L. THAPAR
Assistant Audit Officer
FRS.C.S. & M., New Delhi.

16

AGRICULTURAL RESEARCH

EXPENDITURE FOR THE YEAR 1961-62

Expenditure and Closing Balance			Amount
			Rs. nP.
A.	Standing Charges		16,32,511·54
B.	Research, Training, Publicity etc. under direct control of I.C.A.R. ..		6,79,327·04
	(i) Agri. Schemes	2,29,673·90	
	(ii) A. H. Schemes	99,133·07	
	(iii) Misc. Schemes	3,50,520·07	
C.	Grants-in-Aid		34,63,249·82
	(i) Agri. Schemes	19,69,157·69	
	(ii) A. H. Schemes	11,28,377·99	
	(iii) Combined Agri. and A. H. Schemes ..	1,64,395·09	
	(iv) Marketing	..	
	(v) Cold Storage	..	
	(vi) Miscellaneous	2,01,319·05	
D.	Contributions		37,550·00
E.	Debts and Remittances		1,74,340·30
F.	Capital, Grants-in-aid		Nil
G.	Government Grants		41,98,809·62
	Refunded to the Government of India		1,03,176·96
	Closing Balance		30,56,708·04
	Investments and Re-investments		1,11,50,000·00
		Total ..	2,44,95,673·32

1.	Payments during the year	1,01,85,788·32
2.	Refunded to the Government of India	1,03,176·96
3.	Investments and Re-investments	1,11,50,000·00
4.	Closing Balance	30,56,708·04
	Grand Total ..	2,44,95,673·32

Financial Position (Assets) of the I.C.A.R. (Research Side) on 31. 3. 62.

		Rs. nP.
(i)	Closing Balance as per details given above ..	30,56,708·04
(ii)	Purchase Value of Securities as per statements attached	1,87,92,432·98
(iii)	Imprest A/c (in the name of Additional Secretary) ..	1,000·00
	Total ..	2,18,50,141·02

Sd/—J. P. VAISH
Under Secretary,
Indian Council of Agricultural Research

APPENDIX 17

LIST OF SECURITIES AS ON 31-3-1962

Sl. No.	Particulars	Purchase Value Rs. nP.	Face Value Rs. nP.	Approx. Value Rs. nP.
1.	3% Stock 1963-65	15,54,334·00	16,49,500	16,27,230
2.	2¾% Stock 1962	9,52,736·56	9,50,000	9,42,875
3.	3% Loan 1970-75	54,99,882·02	63,09,400	56,59,532
4.	3¾% Loan 1974	34,99,902·00	35,53,200	35,23,000
5.	4% Loan 1972	18,56,200·00	18,56,200	18,61,768
6.	4% Loan 1979	8,24,828·72	8,22,400	8,16,644
7.	4% Loan 1980	1,80,199·03	1,79,800	1,78,450
8.	4% Loan 1981	35,94,906·12	36,07,000	35,52,900
	Total ..	1,79,62,988·45		

Securities purchased from Prov. Fund A/c.

1.	12 year. N. S. Certificates No. NS/P.O. 87031 to 087035, 087037 to 087041	50,000·00	50,000	
2.	12 year. N. S. Certificates No. NS/028496, 028497, 063601 to 063610	60,000·00	60,000	
3.	12 year. N. S. Certificates No. NS/F 087258 to 087263	30,000·00	30,000	
4.	3½ % National Plan Loan 1964 ..	49,444·53	50,000	49,925
5.	12 year. N. S. Certificates No. G. 113337 to 113346	50,000·00	50,000	
6.	12 year. N. S. Certificates No. P.O. 87126 and G 110921 to G 110931	60,000·00	60,000	
7.	12 year. N. S. Certificates No. G 025275 to G. 025288	70,000·00	70,000	
8.	12 year. N. S. Certificates No. G 0235901 to 0235923	1,40,000·00	1,40,000	
9.	Short Term Deposit Receipt No. F 22339 Payable at a week's notice	20,000·00	20,000	
10.	12 year. N. S. Certificates No. 015041 to 015046	1,50,000·00	1,50,000	
11.	12 year. N. S. Certificates No. H/O 015409 to H/O 015414	1,50,000·00	1,50,000	
	Grand Total ..	1,87,92,432·98		

Job Press Private Limited, Kanpur.